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MILITARY REVIEW

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COMMAND AND GENERAL STAFF COLLEGE
FORT LEAVENWORTH, KANSAS

JANUARY 1952 VOLUME XXXI NUMBER 10

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What's New in Signals?

Lieutenant Colonel Herman L. Purkhiser, *Signal Corps*
Student, Army War College

MAJOR General Spencer B. Akin, then Chief Signal Officer of the United States Army, in summarizing his observations of signal communications in Korea stated, "No major changes are indicated in our present long-range Signal Corps research and development program. The new equipment that is coming out of this program or already rolling off the production lines will ensure that our troops will continue to have the most modern and effective type of military communication that can possibly be devised."

What is this long-range Signal Corps research and development program? What is its basis? How will military communications in the future differ from that of the past? What advantages will accrue to the future commander from present or projected improvements in signal communications equipment? The answers to such questions are of vital importance to all commanders and staff officers.

Before discussing the answers to these questions, it may be well to examine briefly the communications systems and equipment used by United States military forces during World War II. An understanding of the systems is of particular importance, since studies of communications problems in World War II have led to the conclusion that equipment must be designed to fit into an efficient system, rather than building a communications system to fit the equipment.

Communications Systems

Generally speaking, there are three levels of communications systems required for military communications in the Army. First, is the *global* system which connects the Department of the Army to overseas theaters, bases, occupation zones, and other areas in which it is operating. Second, is the *theater* system which serves all echelons in the communications zone from the theater commander down, including tactical commanders who operate in this area. Finally, there are the *combat* systems which serve tactical commanders in the combat zone.

The responsibility for the establishment and control of the three levels of communications systems is as indicated by their titles. However, all systems must be integrated to form a single communications system which is world-wide. Equipment used in one system must be capable of operating with the equipment used in the others. This fact has considerable bearing on the development of communications equipment.

Prior to World War II, the Army *global* communication system consisted

Increased mobility and fire power in combat units require efficient communications means for command and control. The Signal Corps' research and development program provides matériel to fill this demand

of a relatively few long distance radio circuits. These facilities were supplemented by commercial radio, cable, and, where available, by radiotelephone facilities. The equipment used by the Army was of standard or modified commercial design. Continuous wave (Morse code) emission was used. On some of the more heavily loaded circuits, automatic sending and receiving equipment was employed. After the start of World War II and deployment of United States forces over the entire world, this system was expanded, again using commercial type equipment. As the war progressed, radioteletype was developed and most of the global radio circuits were converted to this form of service. A limited number of radiotelephone channels also were established between the United States and the overseas theaters. This system has continued in existence and, at the present time, provides high-speed, automatic radioteletype service to all areas in which Army forces are stationed.

Before World War II, little thought had been given to communications in the area which is served by the *theater* communications system. Special equipment for military communications in this field had not been developed. Doctrine for the provision of communications in the area was nonexistent. As a result, when the need for equipment and operation procedures became apparent, commercial equipment was furnished or equipment designed for use in the combat zone was used. The systems were developed around available equipment rather than being based on a previously developed idea of what was required.

The commercial equipment was bulky, fragile, and took considerable time to install. It possessed features desirable for civilian use but unnecessary from a military standpoint. Many elements desirable from the viewpoint of military communications were lacking, since they were not required in civil communications. Another drawback to the use of commercial equipment was the large number of models, types, and makes of equipment procured. For example, more than 30 different types of telephone switchboards, whose parts were not interchangable, were supplied. This created a tremendous maintenance problem and necessitated a comprehensive training program for installation and maintenance personnel.

The use of tactical equipment in the theater communications systems was not altogether satisfactory. This equipment had been designed for use in the relatively simple combat systems, and did not satisfy fully the requirements for the more complex theater systems. Difficulty was encountered in interconnecting tactical equipment with commercial equipment. Flexibility, particularly in switchboards, left much to be desired. However, the tactical equipment had one great advantage in that it was relatively easy to install and maintain.

The term *combat* systems includes a number of separate communications systems. An essential characteristic of communications in the combat zone is that each commander is responsible for providing his own communications and is provided the means for this purpose. There are the extremely simple systems used by the lower echelons—a company or battalion—which cover a small area. At the other extreme, the field army communications system is complex and covers a considerable area. Because of this great difference in the communications systems at the various echelons, there is a wide difference in the characteristics of the equipment used. Generally speaking, these systems can be broken down into two categories: those used in regiments and lower units, and those found in division headquarters and higher echelons.

Equipment requirements for systems in each of these categories are similar. However, here again it is impossible to draw a definite line between the two groups.

Equipment designed for use at the lower echelons often is used in the higher, and, since communications systems established by the lower echelon must be integrated into that of the higher, all equipment must be capable of working together.

Prior to World War II, the doctrine for the establishment and employment of communications in combat units was well developed. Within the limitations of funds, adequate equipment had been designed. Despite the improvements and changes made during the war, however, many shortcomings still existed when hostilities ceased. The equipment was too heavy, and the range characteristics of radio sets were unsatisfactory. Voice radios used by the infantry, artillery, and armor used different frequency bands, so that intercommunication required the provision of special equipment.

Another characteristic, common to all communications systems established during World War II, was duplication. This was true particularly with respect to radio and wire. Usually each was treated as a separate system, and, where possible, wire and radio nets were paralleled. Little provision was made for interconnecting radio and wire systems. Duplication among various commands and the three armed services also was prevalent. It was not uncommon to find a pole line on one side of the road carrying army circuits, while one on the other side carried air force wires. The practice was even more widespread in the case of radio. Many instances of three or four radio circuits between the same terminal locations can be found. Studies of the traffic on these circuits usually showed none of them to be operating at anywhere near capacity. However, each circuit required its own frequencies, its own equipment, and its own complement of highly skilled technicians to install, operate, and maintain it. While the exigencies of combat demand some duplications in the combat systems, no such reason exists in the fields of the theater and global systems.

Significant Developments During World War II

During World War II, much research and development was done on communications equipment. Three of these developments are of particular significance since they are pointed toward the communications systems of the future. These developments are the portable field telephone and telegraph carrier systems, radio relay equipment, and radioteletype.

Portable Field Telephone and Telegraph Carrier Systems

The first of these, portable field telephone and telegraph carrier systems, allowed high-grade telephone and telegraph circuits to be established rapidly over considerable distances.

Let us digress a moment and explain what a carrier system is and what it will do. Telephone carrier systems may be likened to a group of radio stations. Each station has its own frequency, but instead of broadcasting through the air, the signal follows wires. Several stations may use the same wire, and several conversations may be carried on at the same time. By using separate wire in each direction, or by using different frequencies over the same wire in the two directions, both sides of conversations may be transmitted simultaneously, and telephone conversations can be carried on in the normal manner. Thus, one great advantage of carrier equipment lies in increasing the number of telephone channels which can be obtained over a given number of wires between two points. The carrier system not only increases the quantity of channels but also increases their quality since the equipment has built-in amplifiers. For longer circuits, it is necessary to install repeaters (booster amplifiers) between the terminals. The distance between these repeaters depends upon the type carrier

system used and the type wire on which the system is superimposed.

Telegraph carrier systems use the same principle as telephone carriers. However, they are used to provide multiple teletypewriter channels instead of telephone channels. A single telephone channel, of any type, is used to carry the system. Up to 18 teletypewriter channels may be derived from a single telephone channel, depending upon the type carrier and telephone channel used.

The standard portable telephone carrier developed during World War II provided four telephone channels. It was designed for use over a special cable called "spiral-4," although it also could be used over open wire circuits (bare wire on poles). The standard telegraph carrier provided either four or eight teletypewriter channels, depending upon the type telephone channels used. These carrier systems were widely used in both the theater and combat communications systems. However, they are inefficient when compared with commercial type carriers and are heavy and bulky.

Radio Relay

The second development of significance—radio relay—substituted radio for wire in connecting the terminals of the portable field telephone carrier system referred to above. Here was the first step in the integration of wire and radio communications systems. This was a great advance in military communications for it combined the speed of the installation of radio equipment with the flexibility of the telephone. Just as the carrier equipment had its faults, so did the radio relay equipment. It, too, was bulky, it required unwieldly antennas, its frequency was in the very high frequency band, and it required intermediate repeaters about every 25 miles. In spite of its faults, the equipment proved extremely valuable and was used extensively. At the present, it is used for much of the communications in Korea, and between Korea and Japan.

Radioteletype

The third development—radioteletype—is significant because it allowed radio circuits to be integrated into wire teletypewriter networks. Radioteletype circuits can be connected to wire teletype circuits or to other radioteletype circuits by means of teletypewriter switchboards. Even manual relay from wire facilities to radio is simplified. A teletype message, sent by one means, can be received on a perforated tape and retransmitted on the other means without retyping.

It has been mentioned that most of the global radio circuits were converted to radioteletype operation before the end of World War II. Considerable use of this type service also was made on intratheater radio nets. No suitable mobile unit for use within the combat zone was available, so little use was made of it in the combat systems.

An interesting sidelight on the development of radioteletype was the teletypewriter conference, commonly called the "telecon." By the use of radioteletype communications, conferences may be held between widely separated conferees. Equipment was developed for projecting the received comments on a screen so that many persons could participate at once. Many high-level conferences now are conducted using this means of communication.

Setting Up the Program

At the conclusion of World War II, many studies were conducted on the various aspects of that conflict, including military communications. Recommendations were made by many boards, panels, and individuals, pointing up faults and shortcomings. These recommendations were evaluated and reports of equipment performance were analyzed. An effort was made to look into the future to see how warfare would change and how these

changes would affect the requirements for communications.

The conclusions reached have formed the basis for the research and development program of the Signal Corps. Broadly speaking, these conclusions were:

First, war in the future would be carried on at greater speed and over greater distances than before. These factors of speed and distance would increase greatly the requirements for communications.

Second, equipment had to be smaller, lighter, more flexible, and capable of being used in extremes of temperatures and humidity.

Third, an operational procedure for the development of a theater communications system was necessary, with the duplication of facilities, by the various services, held to the minimum.

Fourth, radio and wire should be integrated at all levels to the greatest degree possible.

Fifth, appropriate equipment should be designed for use in either the combat, theater, or global systems. Use of commercial type equipment, as an expedient, should be reduced and, if possible, eliminated.

Sixth, the number of items of equipment should be reduced to simplify maintenance and training problems.

Seventh, from the standpoint of economy, new equipment should be capable of operating with the old to the maximum extent, since large quantities of the older type equipment were still in existence.

In addition to these general conclusions, many specific conclusions, technical and otherwise, were reached.

Using the conclusions mentioned above as a basis, a comprehensive, long-range research and development program was set up and goals were established. In general, two interlocking programs were conceived; the first to be an interim or short-range program, the second to be the long-range or ultimate program. Most of the equipment referred to by General Akin as being available, or soon to come off the production line, is the result of the interim program.

Practically every piece of Signal Corps equipment, used or developed for use in World War II, has been evaluated, analyzed, and scheduled for improvement or replacement. This equipment ranges from a test clip used by a lineman to a high-powered radio station.

The requirements for an ever increasing number of communications channels has resulted in emphasis being placed on improved multichannel equipment.

The new teletypewriter, a fourth the size of its counterpart, carried by two men.

Progress of the Program

Before discussing the actual equipment which has resulted from the program, let us look at the approach which was taken to decrease the number and types of items required. This has been accomplished through use of the "building block" idea. In the application of this principle, a limited number of units are used as the basic elements for a wide variety of equipment. For example, the

same basic uits are used in many vehicular radios, and, by different combinations of these units, radio sets for varying requirements may be produced. This principle has been applied to radio sets, telephone switchboards, carrier equipment, radio relay sets, and many other signal communications items.

A canvas dispenser containing ½ mile of lightweight, plastic coated WD-1/TT wire.

In discussing the equipment which has been developed, or which has reached that state of development where the final product can be seen, let us start with the equipment which is used by combat troops, at regimental and subordinate echelons.

Field Wire and Switchboards

Let us look at a basic item—field wire. During World War II, three types of field wire were used: an assault wire which was very light and used at the lowest levels; the standard field wire, W-110-B; and a long-range field wire which had a considerably greater talking range. A new wire now has been developed to replace both the assault wire and the W-110-B, while the long-range field wire still will be used in special applications. The new wire, called WD-1/TT, has better range characteristics than either the assault wire or W-110-B. It weighs 48 pounds a mile, which is slightly more than the assault wire, which is about one-half the weight of the W-110-B type. The insulation used has much better moisture resisting characteristics, and is made of plastic which will reduce the requirement for rubber in any future war. A cloth dispenser also has been developed to replace the metal reel used previously. This eliminates considerable weight, eliminiates a real unit for laying the wire, and allows the wire to be laid by airplane, helicopter, rocket, or rifle grenade. This new wire has been used in Korea for a considerable period of time and has proved to be very satisfactory.

A small, lightweight, 12-line switchboard has been developed and soon will be placed in production. This switchboard, called the SB-22-PT, weighs 22 pounds and replaces the old 12-line switchboard which weighed 72 pounds. The new switchboard, while much more compact, incorporates numerous technical improvements over its predecessor. Cords, instead of hanging loose, roll up on reels which keep the plugs out of the dirt thus decreasing the maintenance problems. Up to four switchboards may be stacked, one on top of the other, and operated by one operator. When used in this manner, the operator's telephone set can be removed from all but one switchboard, and five lines can be added on each board in the space thus made available.

Radios

A complete new series of frequency modulated radios for use at lower echelons has been developed and is in production. These radios will replace the frequency modulated radios of the 500 and 600 series. Up to the present time, technical difficulties have prevented the development of a single series of radios which will operate satisfactorily over the wide range of frequencies which must be used to provide the necessary com-

munications for armored, artillery, and infantry units. Sets which are identical, except for the frequency coverage, have, therefore, been developed for these three arms. The radios of this series are identified by the code numbers AN/GRC-3 through -8. The AN/GRC-3, for use in tanks, is identical, except for frequency coverage, to the AN/GRC-5 used by the artillery, and the AN/GRC-7 employed by the infantry. Similarly, the AN/GRC-4, -6, and -8 are identical except for the frequency coverage of each instrument.

In order to provide for intercommunication among the three branches, each of the sets mentioned above is equipped with an auxiliary transmitter and receiver which cover the same frequency ranges. It is planned to install this same transmitter and receiver in army aircraft.

Many improved technical and mechanical features have been incorporated in this series of radios to increase the flexibility of the sets and their ease of operation and maintenance. Each component of the set such as power supply, transmitter, receiver, and auxiliary receiver is a separate package. Each package can be quickly and easily removed from the standard mounting base which contains the necessary interconnecting cables. This feature allows all inoperative components to be replaced quickly and the defective unit repaired without removing the entire set from the vehicle.

The armored unit sets have 80 channels, the artillery 120, and the infantry 170. All channels are available immediately at the turn of the tuning handle, detents being provided to ensure correct tuning. This last feature eliminates the necessity for changing frequency control crystals and realigning the set when new frequencies are to be used. Crystal type frequency stability is obtained through the use of standard crystals permanently installed.

Remote control features are incorporated which allow the sets to be controlled from a distance of up to 2 miles. The remote controller is provided with a modified field telephone for this purpose. A feature of this telephone is that it may be used as an ordinary field telephone, and connected to the unit switchboard in the normal manner. The remote control lines from several radios also are connected to the switchboard. Thus, a commander, if he desires, can use the same instrument to talk over wire or radio. This is an example of the partial integration of wire and radio. Integration is not complete, however, since direct current relays are used to change the radio from "send" to "receive." This requires that the special telephone be used, the switchboard be specifically designed to pass the direct current, and it limits the distance from which the set can be controlled. Experiments are being conducted on the use of voice operated relays which will eliminate these disadvantages and allow the radio to be integrated fully into the wire system. Up to the present, however, a satisfactory relay has not been developed.

The AN/GRC-7—the new infantry unit command set—mounted in a ¼-ton truck.

Another feature of this series of radios

is the incorporation of an automatic retransmission unit in the set. Through the use of this equipment, range may be increased by using intermediate sets between terminal stations. For example, a battalion commander using a pack set of limited power can keep in contact with his regimental commander no matter

The new AN/PRC-10 weighs about half as much as the SCR-300 which it replaces.

where he goes. The battalion commander, using his pack set, contacts the "B" set of the AN/GRC-7; his voice is automatically retransmitted by the "A" set which is in contact with the radio of the regimental commander, either directly or through other radio sets equipped with retransmission units. No action is required by operators at the intermediate sets, and the two commanders use their radios in the same manner as they would without such sets. This feature has innumerable applications and increases greatly the value of the frequency modulated radio.

A great number of additional radio sets can be fashioned to meet special requirements from the components of the AN/GRC-3 through -8 series. Power supplies are available in either 12 or 24 volts, so the sets may be used in vehicles having electrical systems of either voltage. Battery power packs are available for some of the components, permitting them to be used as pack sets. An intercommunication system is available for use in tanks, as are units for controlling the radios from positions in a vehicle other than the radio operator's post.

So much for the vehicular radios. Similar improvements have been made in pack sets. A new set—the AN/PRC-10—to replace the SCR-300, commonly known as the "Walkie-Talkie," has been developed. It weighs approximately 18 pounds as compared with 38 for the SCR-300. It is much smaller, more rugged, and completely waterproof. All channels in the frequency range of the set are available immediately, rather than only a limited number of preset channels. Similar sets are available covering the frequency ranges used by armored and artillery units.

Another new set is the AN/PRC-6, which replaces the old "Handie-Talkie." This new set, unlike the old, is frequency modulated and can be used in conjunction with the "Walkie-Talkie" or with the sets in the AN/GRC-3 through -8 series. It is about the same weight and size of the old set. It, too, is completely waterproof. An additional feature is the provision for use of a separate handset and a carrying strap which allows the set to be used while carried on the back, or to be placed on the ground above the operator's foxhole. The present model has a serious drawback in that only one channel is available, and a skilled technician with special equipment is required for changing channels. Efforts are being made to remedy this deficiency.

Equipment for Higher Echelons

Now let us turn our attention to equip-

ment designed for use at the higher echelons. The matériel which will be discussed may be used at all echelons from the division to the theater. As has been pointed out previously, the desirable goal was to elminate the use of commercial equipment as expedients in the theater communications system, and to design tactical equipment which could be used at all echelons merely by expanding basic units. A great deal has been or is being done toward reaching this end.

Switchboards

In the field of switchboard development, a new switchboard called the AN/TTC-4 is well under way. This switchboard can be increased from a 1-operator position, 40-line board, to a 24-operator position, 2,000-line board, merely by adding units. All connections on this board will be made by plugs rather than by soldering. Many technical features which will speed up operations are being incorporated. It is expected that this switchboard will be used at all but the highest headquarters in the theater. Because it is believed that this type of switchboard will not be suitable for use at division headquarters, a new switchboard for that purpose is under development. This board will incorporate as many features of the larger board as are practical for use in situations normally found at division headquarters. These 2 units will replace more than 30 different types of switchboards which have been used in the past, and will incorporate many desirable features not found previously.

Teletypewriters

A new teletypewriter has been developed and is being delivered to the field. The new teletypewriter, itself, weighs about 45 pounds as against 225 for the model it replaces. With all its components, including power generator, spare parts, and fuel, the new unit weighs 135 pounds and replaces equipment weighing 416 pounds. In addition to being lighter and less bulky, the new teletypewriter is more rugged. It eliminates more than 150 parts and its mechanical parts operate at one-half the speed and require far fewer critical adjustments than did those in the old machine. Because of these features, considerably higher transmission speeds will be possible. It also may be used in aircraft, on ships, or in vehicles without requiring the continual maintenance which characterized the old equipment. Similar improvements are under way with other types of teletypewriter equipment used at higher headquarters.

Equipment for teletypewriter transmission is being developed which will eliminate the requirement for special switchboards to switch teletypewriter circuits. The switchboards mentioned above will be used, with a teletypewriter substituted for the switchboard operator's headset. This eliminates the requirement for complex special teletypewriter switchboards which are difficult to maintain.

The AN/PRC-6, an improved, frequency modulated version of the "Handie-Talkie."

Telephone Equipment

New telephone carrier equipment is in the mill. The new equipment will provide up to 12 channels in 4-channel increments. Thus, a 4-channel system may be increased to 8 or 12 channels by adding additional units of equipment. An improved "spiral-4" cable is being developed for use with this equipment. When used with a four-channel system, devices called loading coils are inserted in the cable connectors to increase the distance between repeaters. With the 8- or 12-channel systems, the loading coils must be removed and repeaters installed at more frequent intervals. Carrier systems with a greater number of channels will become available in the future. An easily installed coaxial cable for use with these carriers, and for the transmission of television signals, is contemplated.

Radio relay equipment, designed to use the carrier system described above, is being perfected. This equipment will be used at corps and higher levels. A lightweight radio relay set for use in the division will be available soon. This latter equipment can be mounted in a jeep and will replace equipment which required a 2½-ton truck. A special lightweight carrier system for use with this radio relay set, or on the new "spiral-4" cable, is well along.

A great deal of work has been done on radio relay equipment which will provide up to 96 telephone channels. This equipment also may be used for the transmission of television and other wide-band signals. It is designed primarily for use in the theater communications system. Laboratory models of this equipment were tested over a year ago. The "building block" principle will be used to provide the desired number of telephone or other type channels. This equipment, while not exactly light, will be transportable and will weigh much less than comparable commercial equipment.

In the field of high-powered radio, the SCR-399, the 500-watt mobile radio set used in World War II, has been converted to radioteletype. This new set is being issued as the AN/GRC-26 and is being used in Korea. Improvements may be expected in this field. The equipment will be reduced in size and weight. High-powered stations, for use in the theater and global systems, are under development. Basic units will serve as low-powered stages for very high-powered stations. Thus, by merely adding amplifiers, the power of a station may be stepped up. Multichannel capabilities, both voice and teletypewriter, will be incorporated in these stations. The equipment will be as light, small, and easy to install as practical. Some of the basic units and amplifiers may lend themselves to installation in vehicles.

Summary

All the foregoing has been a brief outline of the progress which has been made in communications research and development. Many other improvements, in great numbers of items, have been or are being made. New construction trucks and pole-hole diggers have been perfected, a new and better field telephone is under development, and radar is being improved constantly and adapted to new uses.

Much work has been done in the field of the suppression of radio interference from the electrical systems of vehicles, generators, and similar equipment. In this area, the Signal Corps engineer laboratories work closely with similar organizations in the other branches of the Army, as well as with those in the Navy and Air Force.

Doctrine for the theater communications system has been approved and published in a Department of the Army manual. The equipment under development is designed to fit into the systems outlined in this manual, so the goal of designing equipment to do the job required is well within sight.

Conclusions

Just what do these developments in military communications mean to the commander? After all, the purpose of military communications is to provide the commander with the means to control his units.

It is quite evident that the equipment which has been discussed will provide a more flexible and extensive communications system. It follows, therefore, that the commander will have better and more reliable means for the control of his units, and that he will be able to control organizations deployed over a greater area than has been possible in the past.

The greater mobility of the communications means will improve the mobility of units as a whole. The standardization of equipment and a reduction in the number of items will ease a logistical problem which plagued commanders and their staffs. However, it must be realized that improvements in communications have not been made without paying a price. That price is increased technical complexity, and the necessity for more highly trained installation and maintenance personnel at the higher echelons.

We have learned a great many lessons from Korea. It has been a great testing ground for ships, aircraft, and equipment of all kinds.

The American fighting man, whether on land, at sea, or in the air, has again demonstrated that given the proper tools he can do the job. At the same time, it is not our intention, under the present rearmament program, to stock-pile thousands and thousands of guns, aircraft, and tanks, and hundreds of ships of present design.

Our aim is rather to keep improving our weapons and to keep orders moderately low so that our industrial plant will at all times be in a position to expand rapidly if an emergency arises. We cannot afford to pile up equipment which might be obsolete when we need it but neither can we afford not to be ready to turn out the very latest weapons and equipment if necessity compels us to do so.

Secretary of the Navy Dan A. Kimball

Integration of Separate Units

Colonel Richard H. Moore, *Artillery*
Instructor, Command and General Staff College

The ability of the infantry division to absorb and supply reinforcing units such as artillery, armor, engineers, and additional service units gives it a flexibility which contributes heavily to its combat effectiveness.—Field Manual 100-5, *Field Service Regulations: Operations*, paragraph 1023.

CLASSIFICATION
II Corps
GAMBASSI Q5443, ITALY
030900 July ----------
OpnO 5
Map: ITALY, 1:50,000, PISTOLA—CERTALDO

1. *a.* Annex I, Intel
b. . . .

2. II Corps atk 060200 July, seizes crossings over Arno River in zone, and cont atk in direction Binati to seize army brghd line.

3. *a.* 85th Inf Div:
Atch: 612th FA Bn
207th Tk Bn
310th Cml Mort Bn
515th Engr C Bn
(1) Seize crossings over Arno River in zone and obj 1 . . .
b. . . .
c. . . .
d. Corps Arty:
(1) 620th FA Gp: G/S; reinf fires 85th Div Arty with two m and two hv bns
x. . . .
4. . . .
5. . . .

JONES
LTGEN

Annexes: 1—Intel (omitted)
2—Opn Overlay (omitted)
3—Arty (omitted)
4—Engr (omitted)
5—Sig (omitted)
Distr: A
IV Corps
VI Corps
Twelfth TAF (Ftr)
OFL:
/s/ Butcher
G3
CLASSIFICATION

During World War II, the operation order was and, throughout any future war, it will be one of the means used by a higher commander to direct, co-ordinate, and control the efforts of his subordinate commands. It contains all of the essential information and direction which, if accomplished successfully, will secure victory. It lists the tasks and indicates the means available to subordinate units.

From the foregoing operation order, the Commanding General, II Corps, has been directed to force a crossing of the Arno River. In paragraph 3*a*, he has ordered the 85th Infantry Division to seize crossings in its zone and, after full consideration of the needs of the division and of the number and type of supporting units

available, has decided to reinforce the division with four additional combat support units.

The commander of the type corps has available some 40 to 50 separate regimental, battalion, and company size combat, combat support, and service support units with which he can influence the course of battle by attaching them to, or placing them in support of, the divisions in his corps. To ensure that these units develop into an integrated fighting team, the division commander and his staff and the commander and staff of the reinforcing unit must have a complete understanding of each other's missions and problems.

Mass—Co-ordinated Power

A recitation of the mere mechanics of achieving mass through the reinforcement of combat organizations oversimplifies this problem. Mass is not accomplished until the integrated power of the combined units is loosened, as a co-ordinated effort, on the enemy. The simple act of attaching the 612th Field Artillery Battalion to the 85th Infantry Division is only the first step in achieving mass. The 85th Division has been training and fighting as a unit for a relatively long period of time. Through close association and experience, this division has developed teamwork based on a familiarity with the capabilities and characteristics of each of the various subordinate units of the division.

Separate Unit—A Trained Player

In contrast, the 612th Field Artillery Battalion has been, comparatively speaking, a "homeless waif." Basically, this unit has received the same training as has like units in the 85th Division. However, when it is made a member of a new team, it must learn a new "set of signals." It should be remembered that as far as this unit is concerned, this is an entirely new operation and it should receive a complete briefing. It must be supplied with the necessary intelligence information to allow it to adapt its dispositions and plan of action to best defeat the enemy. It must be provided with adequate logistical support to permit it to employ the full weight of its effort in the execution of the division plan. Finally, to gain unity of command, it must be made to feel that it is a part of the "85th Infantry Division team," that it is an integrated and important part of the force that has been formed to defeat the enemy.

A complicating factor in these considerations is the element of time. Because of the ever present paucity of such support units, reinforcement missions, more often than not, will be made only a minimum of time prior to the operation, or after the action has started. In spite of these considerations, the division commander who has anticipated the problems to be faced in absorbing a new unit into his organization, and has provided for its rapid and smooth orientation and integration, will have achieved mass, not only through the addition of a number of weapons, but by the enthusiastic and intelligent employment of those weapons by the supporting unit.

By preplanning, the reception and integration of separate units can be expedited. Action must be taken to ensure that the new unit has the necessary information and facilities to accomplish its assigned mission

It is fundamental that the force which achieves a decisive superiority in infantry, armor, artillery, and other supporting units, and employs them skillfully as a co-ordinated team under conditions

favorable for their operations, has the greatest opportunity for victory.

Characteristics

What characteristics can the commander of the 85th Division expect the reinforcing units to have? He can expect to receive units that are well trained basically in their combat or service support role. Unless informed to the contrary, he can expect them to be at full strength in both personnel and equipment. He can expect them to be willing and anxious to fulfill any mission within their capabilities. The division commander's responsibility consists of understanding these characteristics and utilizing them in such a way as will best assist the mission of his division.

Know the Unit

To best utilize an attached or supporting unit, the complete characteristics and capabilities of that unit must be known to the division commander and his staff. It is not enough to know that its primary weapon can fire a 200-pound projectile 18,000 yards once every 3 minutes, or that a unit can maintain 8 miles of road a day and, in addition, construct one 300-foot panel bridge in a given time. The commander and his staff must know such things as how long it takes to emplace the weapon, what weight and equipment loads it has, how much road space the unit needs, what speed is most efficient for it when moving, what type of communications equipment it has, what type maintenance unit it needs for support, and what type liaison organization it possesses. Without a complete knowledge of these and many other critical characteristics and capabilities, the division commander cannot hope to employ his reinforcing units properly.

Characteristics Compared

The division commander and his staff must compare these characteristics with the characteristics of his own organic units. If they are not in consonance, provision must be made for a satisfactory working plan. If the division depends on radio for its communications and the reinforcing unit is dependent on wire, provision must be made to furnish the unit with sufficient radio equipment. If the speed of the reinforcing unit on the road is slower than that of organic units, it must not be displaced first, thereby blocking the advance of the organic units. If, to fulfill its service mission satisfactorily, a service unit should remain in one position at least 2 days, it should not be displaced with every forward move of the division. There are many varying factors, each of which must be considered, before the most efficient use of reinforcing units can be made.

Unit Commander's Responsibility

It is not intended to imply that the unit commander has no responsibility in these matters. In many situations, the supporting unit commander will be the principal source of this information. He is the individual most familiar with his unit and its capabilities. In the absence of other information, the division commander and staff should take full advantage of his background and experience.

Program

To arrive at a standard procedure for all divisions for the integration of separate units in the shortest possible time is, of course, an unattainable ideal. However, thought on this problem will develop the essential factors of a program that must be developed to absorb a new unit successfully into a division. These factors may be formalized into a standing operating procedure for the receipt of new units, or they may be developed as check lists, to be used by key personnel in a division to facilitate the receipt of new units. No matter what form this indoctrination

procedure takes, the policies must be established by the division commander and be actively implemented by his staff.

To a great extent, the time available will determine how complete the orientation can be for a newly arrived reinforcing unit. How much and what types of combat or service experience the reinforcing unit has had will determine the amount of indoctrination required. Under any set of conditions, however, plans must be made to provide the newly arrived unit with the minimum essential information.

Command Procedure

The program should make provision for an early meeting of the division commander or assistant division commander and the commander of the reinforcing unit. Any misunderstanding as to the terms of the attachment should be clarified. The command relationship within the division, as it affects the reinforcing unit, should be discussed; that is, will the unit operate directly under the division commander or is it to be further attached to a subordinate headquarters within the division? Any administrative problems facing the unit, requiring command assistance from the division commander, should be explored thoroughly.

Operations

The questions uppermost in the mind of the commander of a separate unit, after receiving a supporting mission, are what is the mission of the division to which I have been attached, and what will be my role in the operation? Without complete answers to these questions, any support received by a division from a reinforcing unit will be, at best, sporadic. The full utilization of a unit is dependent upon the initiative and co-operation of that unit. This initiative and co-operation can be engendered only when the unit has received the complete details of the over-all plan, and is kept informed constantly of current modifications.

The G3, the special staff officers, and the S3s of the subordinate units of the division must assume the responsibility of providing this information to the reinforcing unit(s). The information on the mission should include the mission of the corps as a whole, and how the mission of the division fits into the corps plan. Information also should be available on the missions of units adjacent to the division, and the effect their activities will have on this operation.

The plan for the operation should be explained in detail to the commander and staff of the incoming organization. This orientation should include:

1. The details of the division operation plan and the role it is contemplated that the reinforcing unit will play in the plan.
2. The locations and plans of like units attached or organic to the division.
3. The locations and plans of other subordinate units of the division, with particular attention given to those divisional organizations which will be reinforced or supported.

The results of past operations, and any future contemplated operations, as they will affect the reinforcing unit, should be explained fully. For instance, have night interdiction fires been effective in the past? Has there been considerable use made of chemical smoke in attacks up to now? Will the division continue to make the main effort of the corps, or will it soon take over a flank protection role? Information based on these questions, and others of comparable nature, will bring the newly arrived commander and his staff into the division picture. It will give them the necessary working knowledge to plan their future actions.

The division G3 and the subordinate units S3s must not overlook the essential administrative matters of liaison and communications facilities that must be

established for the operation, or the operational reports required by the division or higher headquarters. Failure in either of these matters may negate the best efforts of both the division and the unit to exploit fully the unit's capabilities.

Intelligence

Too much emphasis cannot be placed on the receipt of detailed information and intelligence of the enemy by the incoming unit commander and his staff when developing a program for the smooth integration of a reinforcing unit into the battle team of the division. It must be remembered that for the newly arrived unit, this is an entirely new operation. This unit has not been facing the same enemy day after day. The terrain over which the division will advance is unfamiliar. The division G2 and the subordinate S2s must be prepared to provide detailed information about the enemy, to include:

1. An estimate of the size of the enemy's forces facing the division together with his reinforcement capabilities.

2. The type of resistance with which the enemy has been confronting the division. Has he been using mines, chemicals, and tank obstacles? Does he have air support? Is he dug in and has he been using pillboxes?

3. The type of equipment the enemy is employing. Is he heavy in armor, artillery, or mortars?

4. The type of tactics employed by the enemy. Does he counterattack in strength? Does he use a heavy artillery concentration preceding an attack? Does he employ night attacks frequently?

The new unit will require detailed information about the terrain in the division zone, as, for example, where can good ground observation be obtained, what type of roads can we expect to find in our advance, what natural or artificial obstacles are there before us, from what points has the enemy ground observation, and is the cross-country trafficability in the division zone good or poor?

The G2 must be prepared to provide maps for the incoming unit(s). They will want to know how many maps are available, what type of map or map substitute will be used, and where the maps can be drawn.

The expected attitude of civilians in the area will be of keen interest to the newly arrived unit commander who will want to know if they will be friendly, passively resistant, or actively antagonistic.

The new unit must be oriented on the reports required by the division and higher headquarters. Of particular importance is the standing operating procedure concerning the time and methods for the transmission of intelligence reports.

These intelligence questions and many others will have to be understood fully by a new unit coming into the division. The type and mission of the unit concerned will determine where its interests lie, as far as enemy information is concerned. A service unit will be more interested in enemy air and long-range missile capabilities, while an armored battalion may be more interested in enemy antitank capabilities.

Logistics

The G4 of the division, the technical staff officers, and the subordinate staff S4s must be kept fully informed on expected reinforcements. They must be prepared to give full logistical support to these units. To a great extent, the amount of support a division will receive from a reinforcing unit is dependent upon the logistical support the unit itself receives from the division. The more energy a unit must expend on self-support, the less it has remaining to support the division. Any orientation of such a unit must include:

1. A full discussion of the current administrative order together with its latest modifications.

2. A clear understanding of what, how much, where, and when supplies will be drawn.

3. Any contemplated moves of division logistical installations.

4. An explanation of traffic restrictions and regulations within the division area.

5. A clear understanding of the maintenance support to be furnished by the division.

6. A listing of all the reports required by the division or higher headquarters.

Without the necessary information on the logistical support to be furnished by the division, it will be impossible for the newly arrived unit commander to plan for and provide efficient support for any operation of the division.

Personnel

Because of the temporary nature of the time reinforcement assignments will remain in effect, the G1 of the division will find it most difficult to co-ordinate his over-all personnel plans with the incoming unit. This does not mean that the personnel problem in the separate unit is not just as real and just as acute as in a unit organic to the division.

A failure on the part of the division to provide the same personnel services for reinforcing units that it does for its organic units can stifle more quickly the morale of a reinforcing unit than any other one factor. Conversely, equality in treatment will strengthen the feeling of "belonging" in these units, and pay tremendous dividends in the enthusiasm with which the units will carry out their part of the operation.

To facilitate the integration of a new unit into the divisional organization, a full explanation of the personnel policies of the division should be provided, to include the:

1. Amount and type of personnel services to be furnished by the division, such as motion pictures, post exchange facilities and supplies, newspaper distribution, and mail.

2. Leave and rest policies current in the division.

3. Divisional policies on awards and decorations.

4. Availability and status of replacements.

5. Time and type of any personnel reports required by the division or higher headquarters.

Use These Units

There is one more important phase which must be considered and should be planned for to ensure the proper integration of a separate unit into a combat division; that is, the early use of the unit itself. No unit will assume that it is of value to a division if its capabilities are not utilized. Definite missions must be assigned to the reinforcing unit, within its characteristics and capabilities, at the earliest possible time. This action not only assures the supporting units that its capabilities are recognized by the division staff, but that it is actually needed by the division. Also, it provides an opportunity, early in the operation, in which any difficulties or inconsistencies between the division and the unit can be ironed out before an emergency arises. It gives both parties an idea of the standard of performance to be expected from each other.

Summary

Early and prompt action should be taken on a command level for the establishment and implementation of policies for receiving and integrating reinforcing units into the over-all fighting force of a division. These policies should be developed into a program that will ensure that no critical item is overlooked, or, that in the confusion of combat operations, no unit is forgotten.

It is hoped that the foregoing discussion will contribute to a better understanding of the problems to be faced in establishing the teamwork required to achieve *mass* by assigning separate units to a division. If your division is reinforced by units, either by attachment or in a supporting role, utilize them to the full extent of their capabilities and characteristics. By preplanning, expedite their reception and integration into your organization. Make certain that complete action has been taken to ensure that the new unit has the necessary information and facilities to accomplish the mission for which it was designed.

The primary aim of manpower mobilization is to safeguard our national security through the maximum development and use of our human resources. In particular, this involves:

A. Providing manpower for the armed forces in sufficient numbers and with the mental, physical, and occupational qualifications necessary for national defense.

B. Providing manpower for producing the materials and services necessary to the armed forces, to meet commitments of aid to other nations, and to support the civilian economy.

C. Constantly increasing our mobilization potential through training and educational programs to expand our supply of persons with highly developed skills essential to civilian and military activities. Providing manpower for protection of the civilian health and welfare.

President Harry S. Truman

The Neglected Staff Officer

G3, Communications Zone

Lieutenant Colonel Robert C. Forbes, *Infantry*
Instructor, Command and General Staff College

WHAT do *you* know about the duties and responsibilities of the G3 in a communications zone? Are his functions comparable with those in a tactical command? Could *you* serve effectively as a G3 in this service-type command? These queries pose serious problems to all professionally minded officers, who remember that, based on World War II data, approximately 25 percent of all troops in a theater of operations normally are assigned to the communications zone. You stand, then, a one-in-four chance of being assigned to this type of command.

Field Manual 101-5, *Staff Organization and Procedure*, states, in part, that: "The assistant chief of staff, G3, assists the chief of staff in the co-ordination of functions pertaining to organization, training, and combat operations." These functions are the same in all headquarters, but the emphasis placed on each function varies with the mission assigned. Thus, due to the mission of his command, the communications zone G3 is in an organization whose main reason for existence is the providing of supplies to the combat zone. It follows logically, then, that his activities, planning, and actions must be focused on supporting the logistical plans—developed, primarily, by the G4.

Should the communications zone G3 be *logistics minded?* By all means. He then can discharge his responsibilities most effectively. This does not mean that the G3 is subordinate to the G4. In a communications zone headquarters, as in any headquarters in the combat zone, all general staff officers are *coequal* members of a coordinating, planning, and advisory staff; no one section is more important than any other. With these fundamentals in mind, let us consider the major fields of interest that are of primary importance to the communications zone G3.

Hypothetical Situation

Let us assume, for the purposes of discussion, a situation wherein allied forces in Europe were attacked by an aggressor force on 1 February. A stubborn delaying action was fought and, by 1 June, the enemy controlled only so much of Northern France as was east of a general line Caen —Laval—Nantes. On 22 July, the allies launched an offensive and, by 1 September, have advanced to the line indicated on Sketch Map A. The theater of operations has been divided into a communications and a combat zone. The communications zone has been subdivided into two base sections—Cherbourg and Brest—and one

Basically, the G3s in the combat and communications zones have similar duties and responsibilities. We must become familiar with the peculiarities of the latter if we are to function effectively in the rear areas

advance section—ADSEC—as indicated on Sketch Map A. The communications zone is responsible for the provision of administrative support to all army forces in the theater, and for the administration and defense of its own area. Operations have been decentralized to subordinate sections.

The G2, on 2 September, informed you, the G3, Communications Zone, that numerous small enemy forces, bypassed by the advancing 31st Army Group, have been reported in the general area Perigueux—Limoges (130 miles south of Tours). The largest of these forces is the approximate equivalent of a regimental combat team. They are presently moving north over a wide front. The G2 stated that these forces are capable of launching scattered attacks, or a co-ordinated attack, with a maximum force equivalent to two depleted divisions anywhere against the Advance Section or Brest Base Section after 6 September.

The G2 further informed you that enemy agents have been apprehended in the vicinity of Chateaudun. These agents revealed that they had been directed to obtain detailed information to facilitate an airborne attack on a guided missile fuel plant located in that area. The G2 confirmed the fact that the enemy possesses enough airlift for raids of this nature and is capable of establishing local air superiority for airborne attacks anywhere in the communications zone.

Communications Zone Operation Order 2, now in effect, requires each section to co-ordinate plans for the local defense of its installations and to be prepared to assemble a provisional defense force equivalent to two engineer construction battalions on 6 hours' notice for emergency use in the section. No combat troops have been assigned to the communications zone for its defense.

How are you, as the G3, Communications Zone, going to ensure an adequate defense of your command against these threats?

Defensive Operations

Every commander is responsible for the defense of his own command. This is axiomatic. The commanding general of a communications zone is accountable for the defense of the rear area installations against any form of attack. The communications zone is vulnerable to all types of action. Specifically, they may take the form of air attacks to include bombing or strafing missions, or airborne operations; ground attacks to include armored operations and action by partisans, guerrillas, bypassed units, or acts of sabotage; naval attacks to include the launching of amphibious operations, naval shellings of port installations, and attacks on harbor shipping by submarine; and atomic, biological, chemical, and radiological attacks which might be delivered from any of the three mediums—air, ground, or sea.

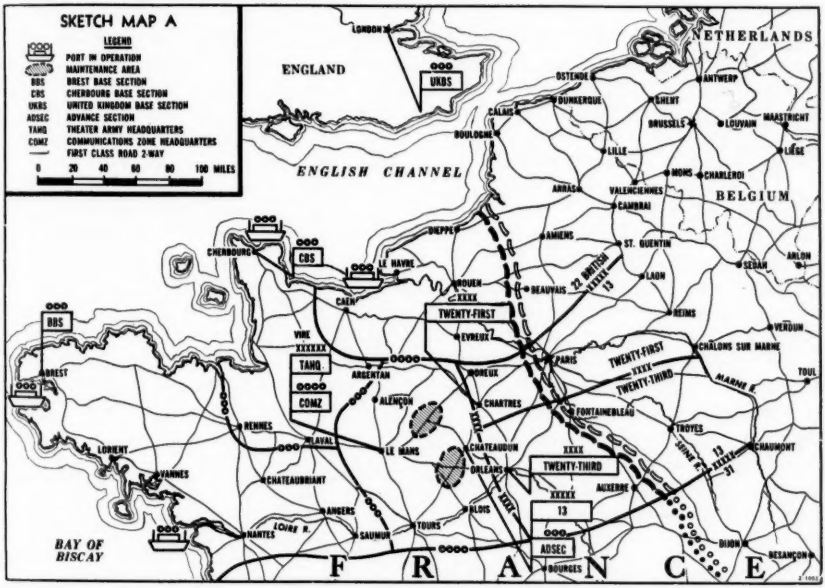
Responsibilities *versus* Training

Ground defense and defense against airborne attacks present particularly knotty problems in the communications zone. The service troops assigned to the command must be held responsible for the local defense of their installations. Combat troops usually are not available in sufficient quantity and must not be taken from their primary mission—employment in the combat zone—and used for the defense of rearward installations outside the combat zone. To further complicate the problem, service troops normally are not qualified, by reason of armament and training, to offer any strong resistance to sizable bodies of enemy combat troops, let alone conduct offensive operations. The G3 must realize these limitations in arriving at a sound plan for rear area defense. His principal responsibility is to ensure that all units are capable and adequately prepared to defend their own installations and to assist in the general defense of a given area. This requirement poses a tremendous training problem.

Use of Combat Troops

Are combat troops ever available for the defense of the communications zone? *Yes.* For local defense? *No.* For general defense? *Yes.* Paragraph 130 of Field Manual 100-10, *Field Service Regulations: Administration,* states, in part: "Suitable combat units, preferably highly mobile troops, are assigned to the communications zone commander by theater for general defense purposes." This does not mean that combat troops habitually are assigned to the communications zone for its defense. The number of combat troops available, the enemy situation, the terrain, the importance of individual installations, and the mission of the communications zone and theater affect the probable assignment of such units. While combat units may well be attached to the communications zone to meet a particular threat, such troops probably will be withdrawn when the specific danger no longer exists. In passing, note that incidental protection *is* afforded the communications zone by combat units located therein for rest, rehabilitation, training, or when passing through the communications zone in a transient status.

In the situation presented in the foregoing paragraphs, the theater army G3 should be presented with the facts and requested to provide combat troops in adequate numbers for the general defense of the communications zone.



Once assigned to the communications zone for its general defense, the manner of employment of such combat forces becomes an important consideration. Should such units be further attached to subordinate sections, or retained under centralized control? Decentralization may well be preferable when one or more of the following conditions exist:

1. A stable tactical situation exists in the theater.

2. The terrain and rail and road networks are such as to prevent rapid movement of combat troops to the affected areas.

3. Highly critical or vulnerable installations are located in the communications zone sections.

4. The communications zone is of such large size as to render ineffective any adequate support from centrally located and controlled units.

5. The enemy has the capability of engaging in large-scale airborne or partisan operations. In both cases, the defender must move quickly, with decision, and in sufficient force to neutralize the enemy's advantage gained through surprise.

6. The enemy has air superiority. Such a situation would necessitate decentralization to permit rapid and powerful counteraction against ground attacks.

7. The communications zone is composed of island bases or widely separated areas.

On the other hand, centralized control of available combat forces is indicated when:

A. The situation is very fluid.

B. The communications zone is relatively small in size.

C. The road and rail nets are highly developed and in an efficient state of operation.

D. The affected combat units, allocated to the communications zone, are highly mobile.

In the current situation, conditions as outlined in points 2, 3, 4, and 5 exist. Therefore, units of the size of regimental combat teams should be attached to the Brest Base Section and the Advance Section, and the remainder of the combat troops held under communications zone control as a centralized reserve. When committed, however, this reserve should be attached to the section in whose zone it operates. The respective section G3s must analyze further the conditions prevailing in their areas to determine where best to place available troops and how to utilize them to the maximum advantage.

Regardless of the headquarters exercising command over the combat units involved, there are certain basic facts that the responsible G3 must keep in mind in determining their method of employment for general communications zone defense. Neither the section nor the communications zone headquarters is equipped for planning or conducting combat operations. Combat units should be given mission-type, rather than detailed operation, orders. Combat units attached to subordinate sections must be prepared to operate, not only in the section to which attached, but, in case of necessity, anywhere throughout the entire communications zone. Co-ordination must be effected between combat and communications zone commanders at all echelons to ensure the complete integration of the planning and combat effort. Combat units should not be parceled out piecemeal to subordinate commands—tactical and unit integrity should be retained for their most effective employment.

Territorial Organization

A major responsibility of the G3 is the determination of the territorial organization of the communications zone. Paragraph 7*a* of Field Manual 100-10 states, in part: "The primary purpose in designating a communications zone is to relieve combat zone commanders of responsibility for logistical and territorial activities not immediately affected by the conduct of combat operations." Therefore, the internal organization of the communications zone, itself, must be such as to ensure the most effective support possible to the combat zone. Many factors—size and type of theater, enemy situation, terrain, communications facilities, political implications, defense considerations, and service to supported troops—must be considered and analyzed in determining the organization to be adopted. Where possible and

practical, the communications zone will *not* be subdivided into subordinate commands. However, based on the factors indicated above, it may be divided into base, intermediate, or advance sections; districts within one of the sections; and areas within a district, using a logistical command as the command agency when available and appropriate.

The general staff officer responsible for making recommendations to the communications zone commander as to the best organization of the command to accomplish its assigned mission is the G3. As has been indicated, there are, within general organizational patterns, many considerations that influence the adoption of any particular organization. The G3 must co-ordinate with all the general staff sections in the headquarters to ensure that the adopted organization will best accomplish the command's mission, and that the proposed organization can be supported administratively. He must maintain contact with higher, supported, and adjacent commands to obtain early information on plans for future operations that will affect the operations and organization of his command.

The organization, finally adopted, is not a static one. It is subject to constant and continuous change dependent upon changes in the basic factors considered. Therefore, long-range planning and co-ordinated effort must be initiated and continued to ensure the type of organization that will be able to meet its future tasks adequately.

The establishment of subordinate command echelons within the communications zone gives rise to additional problems for the G3. First, the requisite units, logistical commands, and, in exceptional cases, bulk allotment authorizations for the new command(s) must be taken from the current authorized strength, or increased authorization obtained from theater army. The latter requires considerable justification. Such shifts in personnel and units cause, each time effected, a detailed reexamination of the entire organizational structure of the command. Obviously, such far reaching changes cannot be executed on the spur of the moment. Again, advance planning must be effected to ensure the continued efficiency of operations.

Operations Decentralized

When a communications zone is organized into sections, operations are decentralized to the section commanders. Each of these commanders exercises territorial control over the geographical area enclosed within the boundaries of his command. This control includes the responsibility for all matters—maintenance of law and order, the control of the civil populace and defense, and, often, the operation of military government—within his area that are not the normal command and operational responsibilities of a commander for his own unit or installation. The G3's interest here, from the level of the communications zone headquarters, is one of providing sufficient personnel authorization to permit the section commander to discharge his responsibilities adequately. Once furnished, the G3's responsibility for the subordinate command consists of the integration of operations, training inspections, and defense.

Hypothetical Situation Continued

Now, let us develop our situation a bit further. The advance to the east continued and, by 1 January, the situation was as indicated on Sketch Map B. A severe winter and stiffened enemy resistance have resulted in the temporary assumption of the defense by the allies. Offensive action is to be initiated again on 15 February. As the 31st Army Group advanced, ADSEC assumed control of the territory in the rear of the armies' rear boundaries and moved its installations forward to provide the necessary support for the combat zone. The communications zone was reorganized to include the France Intermediate Sec-

tion, the Seine Section (to control Paris and its environs), the Cherbourg Base Section, and the Advance Section.

The theater army commander has requested the recommendations of the Commanding General, Communications Zone, concerning the organization of the area behind the armies' rear boundaries after the enemy has been driven to Eastern Germany.

For planning purposes, and for the purposes of this problem solely, let it be assumed that heavy fighting will continue in the combat zone, and that the local civilians in Germany will be hostile. Intelligence reports indicate that preparations are being made for partisan activities against all allied military installations. These activities will be on a scale which will require large numbers of combat troops to protect the lines of communications. Tentatively, based on the terrain, size of the population, industrialization of the area, and partisan activities, it is assumed that one infantry division, or its equivalent, will be required for each 10,000 square miles of occupied territory.

The territorial organization recommended must facilitate both local and general defense. Additional defense forces may be needed and, dependent upon enemy capabilities, their employment may require special consideration as to the orianization of the command. The G3 may recommend that the combat zone commander be held responsible for territorial control and that the communications zone commander be concerned with administrative support only. (This condition applied in the European Theater of Operations during World War II. The Continental Advance Section, while operating in Germany, was relieved, by the 6th Army Group and later by the 12th Army Group, of territorial responsibility in Germany, except for its own immediate installations and local areas around them.) Further the G3 may recommend that additional combat troops be made available to the communications zone for general defense purposes; or that separate combat commands be established within the communications zone and that they be given sole responsibility for the protection of the lines of communications.

In reaching a decision as to the organizational structure required, based on defense needs, the G3 should, at all times, keep firmly in mind the undesirability of having army group or army commanders forced to divide their attention and resources between combat operations to the front, and additional territorial and logistical operations to the rear. In the event of large-scale combat operations in the rear areas, the G3 must consider the desirability of recommending the establishment of a *new combat zone* for the affected area or areas.

Troop Planning

The largest single task confronting the G3 of a communications zone is troop planning. Constant changes in the tactical and administrative situations require continuous study, flexibility, and adjustment of troop requirements. As these requirements are determined, additional work and study are necessary to determine the available sources of manpower.

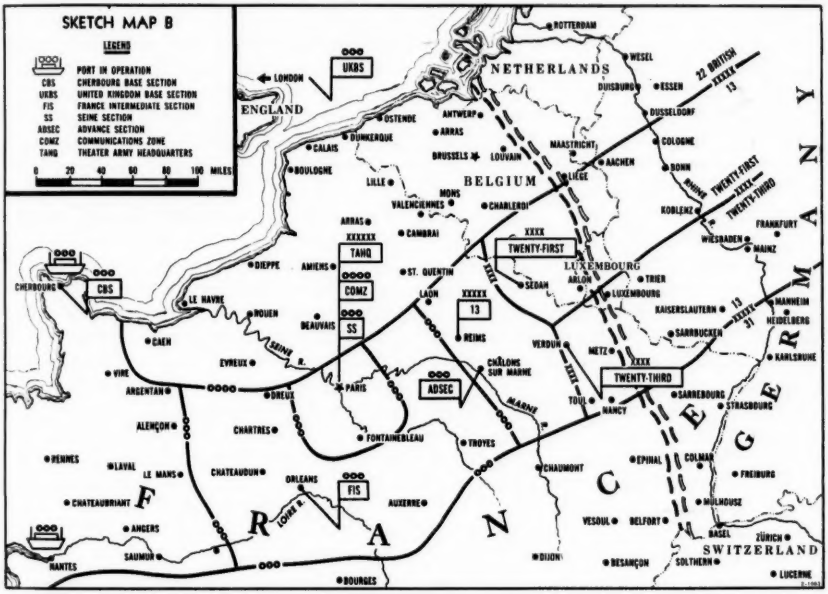
The G3 is concerned with the maximum utilization of available manpower and, at the same time, the most efficient use of all units—military and civilian—to best accomplish the over-all mission of the command. He, therefore, must appreciate the capabilities and limitations of service units so as to effect proper substitutions where appropriate. He must be familiar with all the sources of service units within the command, including prisoner of war and civilian labor units, and must be prepared to utilize prisoners of war and civilians—either as units or as individuals—to replace military units or individuals wherever feasible.

The delineation of general staff responsibilities for troop planning must be

clearly established and understood. The G1 is interested in the adequacy of the troops of the administrative services, and the G4 is vitally concerned with the sufficiency of troops for the technical services. However, the preparation and balancing of the over-all troop basis are functions of the G3. Based on the troop ceiling for army troops in a given theater, the theater army commander establishes an authorized troop ceiling for the communications zone. The assigned mission, availability of personnel, and the necessity of constituting a balanced force are considered and weighed in determining the number and types of troop units and spaces desired. The communications zone, in turn, must assign and reassign units to subordinate commands to meet their operational requirements. This is a constant and ever recurring G3 activity.

The G3, charged with this responsibility for troop planning, acts, in the absence of conflict, as the final co-ordinator of troop requirements. The preparation of detailed service and administrative troop estimates is the responsibility of each special staff section affected. These sections, knowing the command's mission and the scope of future operations both by supported and adjacent units, are best qualified to determine the specific type units, together with the numbers thereof, that will be required for contemplated operations within the troop ceilings furnished by the G3.

By means of concurrent planning, accurate forecasts of specific troop requirements can be made. The needs of each special staff section are co-ordinated by the interested general staff division to ensure sufficiency and to avoid excesses. When the detailed requirements are completed and concurred in by the concerned general staff sections, the G3 then becomes responsible for determining their availability within planned or authorized troop



ceilings. If, after careful consideration, the established individual service ceilings are insufficient, the G3, acting with the approval of the commander, must solve the difficulty. Some of the means by which additional units may be acquired are the:

1. Transfer of type or surplus units required from one subordinate command to another.

2. Substitution of available units for type units not available.

3. Reorganization, re-equipment, and retraining (conversion) of surplus units of a different type to enable them to perform the functions of the type units required. This action requires Department of the Army approval on Table of Organization and Equipment units and theater approval on Table of Distribution units.

4. Organization of Provisional (Table of Distribution) units from bulk personnel allotments.

5. Allocation of prisoner of war or civilian labor units, or the securing of an increase in current authorizations for these units.

6. Authorization to substitute civilian or prisoner of war personnel for certain type duties within all units. Such action will provide additional personnel that can be used in forming needed units.

7. Recommendation to theater army that an increase in the troop ceiling and troop basis be authorized to permit the assignment of needed units from other commands.

Liaison, Planning, Training, and Troop Movements

Additional major responsibilities of the G3, communications zone, are in the fields of liaison, planning, training, and troop movements.

Close contact is maintained with higher, supported, supporting, and adjacent commands. The primary purpose served by such liaison is to obtain early advice on plans for future combat and the administrative operations which may affect the command. An analysis of the plans for future operations of these commands is necessary so as to determine their effect on the troop requirements of the communications zone. This analysis is given the commander and the remainder of the staff for planning purposes.

An analysis of current communications zone operations in the light of future plans is mandatory. It permits timely action to increase or decrease the number of troops, specific type units, and installations. This recommendation, as well as the preparation of operational planning directives for the command, is a G3 responsibility. He also assists the other general and special staff sections in the development of their plans.

As in the combat zone, logistical plans are dependent upon tactical missions. The communications zone G3 must prepare forecasts of supported strengths, based on the analysis of the plans of the higher, adjacent, and supported commands. These forecasts provide a basis for planning by other staff sections. Such forecasts are particularly important in theaters containing isolated bases, islands, or similar areas because they assist all services in planning the necessary shifts in supplies and service troops as rear bases are closed out. In this manner, an economy of force is implemented.

Training problems for units in the communications zone are much different from those normally experienced in combat units. The primary reason for the difference is the composition of the former command—administrative and service troops. Many of these units include a wide range of specialists with resultant multitudinous training peculiarities and problems. In addition to further training in the performance of their primary technical duties, each individual must be trained to operate effectively as a combat infantryman. When it is realized that these units must operate efficiently 24 hours a day at their primary task, the magnitude of the

training problems assumes major proportions. The G3 has the further responsibility of providing facilities and training areas for combat troops located in the communications zone for rest, rehabilitation, precombat training, or when they are in an intransit status.

By reason of the number of units involved, troop movements are a very time-consuming and intricate operation. Not only must the G3 ensure the movement of the many hundreds of assigned and attached units, but he is accountable for the movement of all units arriving in a theater that are destined for the combat zone. He also is responsible for the movement of all units leaving the theater.

Conclusion

In summary, we can say that the G3 of a communications zone headquarters is in a command which has not as yet become a stereotyped military unit; its origin and organization is completely dependent upon the existing situation. As a member of a service-type command, he must be logistics minded and have an intimate knowledge of the units—their capabilities and limitations—which are organic or attached to the command. His problems are varied, trying, and, in many ways, foreign to any he may have encountered in his previous service. He must be flexible, analytical, and co-operative. Above all else, he must be a planner and a co-ordinator. Finally, the communications zone G3 must function as part of a smoothly operating staff, with no one general staff section more important than any other, all of whom assist the commander in the execution of his mission.

Basically, the G3 of a tactical unit and the G3 in a communications zone have similar duties and responsibilities. The scope of interest and the problems that arise most certainly will vary and, for this reason, if for no other, interested officers must study communications zone peculiarities in time of peace so as to be able to function more efficiently in time of war.

Many future weapons may be dramatically different from our present armaments. Meanwhile, however, we must rely upon proved, tested, and available models to win today's battles with the men presently trained to use them. Although General Ridgway and the men in Korea are defeating masses of manpower with fast and accurate fire power, the Eighth Army cannot win one battle, or hold 1 mile of front today, with a weapon that is still to be tried at Frenchman Flat in Nevada.

Secretary of Defense Robert A. Lovett

The Training of Loss Replacements

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army, the Army War College, or the Command and General Staff College.

This is the second of a series of two articles on this subject. The first article of this series appeared in the December 1951 issue.—The Editor.

Organization for Training and Production

Zone of Interior

THE basic requirements for the success of a world-wide replacement system are the selection of reliable key personnel, a clearly defined chain of responsibility and authority, and the means to accomplish the missions assigned.

The responsibility for the maintenance of Army forces in the Zone of Interior and overseas rests with the Chief of Staff, United States Army. The general staff assists the Chief of Staff in carrying out his responsibilities for the replacement system through normal staff functions. The Office of the Assistant Chief of Staff, G1, now has primary general staff supervision over this system, including Selective Service calls, induction, classification, assignment, morale, and the administration of individuals. The G1 must keep before the strategic planners a clear picture of Army manpower capabilities. He must compute phased personnel requirements, by category, for each pipeline increment to include personnel in the Department of the Army Detachment of Patients, battle and nonbattle loss replacements, personnel in the process of reassignment, personnel in the process of induction, inductees in the process of classification and assignment, and personnel in transit. He must compute phased requirements from which are determined phased induction increments and training loads. The highest degree of co-ordination with other Department of the Army agencies is essential, and the G1 should participate in the strategic planning relative to the utilization of manpower.

The Assistant Chief of Staff, G3, is responsible for the balancing of requirements and resources, the establishing of priorities, the formulating of training policies, the allocating of training stations, and determining activation schedules and diversions from the pipe line.

The Assistant Chief of Staff, G4, coordinates the logistic support required to process, house, feed, clothe, equip, and transport replacements so as to ensure their expeditious and timely arrival where needed.

The Adjutant General's Office should be the only operating agency on the Department of the Army level for the replacement system. It is responsible for the analysis and evaluation of basic data used in computing the number of replacements—by arms, service, and military occupational specialty—required to replace losses for all causes. All requests for replacements and all data relative to

shipments are channeled through The Adjutant General in order to eliminate duplication, overlap, and improper demands. Strict control over the assignment of all replacements in the pipe line is centralized in this office.

The control of all replacement installations in the Zone of Interior, including joint induction stations for which the Department of the Army is executive agent, reception centers, schools, replacement training centers, replacement depots, rest centers, and separation centers, as well as individuals not assigned to hospitals and units, should be vested in a Replacement and School Command. The headquarters of the Chief, Army Field Forces, should be redesignated as an army group headquarters, with a commanding general in full command over the continental armies and a Replacement and School Command, all on the same level.

This broadens the task of the Replacement and School Command beyond its World War II concept. This command should be responsible for the operation of all basic training establishments, and the service schools of all the arms and technical and administrative services. It should receive its own bulk allocation of personnel, including all trainer personnel, and should have the authority to shift personnel where needed. Commanders of the Zone of Interior armies should provide general logistic and administrative support for all the installations of the Replacement and School Command. All installations should be organized along functional lines, under standard tables of distribution similar to those in use at the end of World War II. Phased requirements for all installations and facilities should be developed by this command as a part of its training plan.

Overseas Theaters

For theaters of operation outside the continental United States, an established doctrine should be applied for all overseas replacement commands. The theater replacement system must be established concurrently with the arrival of the initial forces. The normal staff responsibilities should apply. The links in the system should be as few and as direct as possible, and should be deployed well forward in support of combat operations. All depot units should be organized in accordance with approved Tables of Organization and Equipment, trained in the Zone of Interior, and shipped overseas as required to support the theater from the beginning of the build-up for operations.

The theater replacement system should be a joint replacement and school command directly responsible to the theater commander. Replacement depots should be attached to task forces for special operations. In the establishment of an airhead, provisions must be made for the receipt of replacements similar to those at a port of embarkation. Each army commander within a theater requires a replacement depot under his own control for the reception, quartering, messing, and shipment of both incoming replacements and outgoing casuals.

Procurement of the quantity and quality of personnel should be based on a cross section of available manpower and an equitable distribution among the services according to assigned roles and job requirements

The replacement company of the division is a vital link in the pipe line. It receives replacements for indoctrination and assignment to units, and processes rotation and leave personnel of the division. It is from this point forward, that

is, the units receiving replacements, that the process of assimilation and intra-group ties can be made to play a central role in combat motivation. Replacements will have high confidence in veteran non-commissioned officers, and will take pride in the name the unit already has established for itself. By the same token, bitterness and reluctance on the part of veterans will be reflected in new replacements.

The headquarters in an overseas command primarily concerned with replacements, training, and rotation problems are those of divisions, armies, and the theater. Logistic support should be rendered by the communications zone for replacement installations therein, and by a field army for those assigned or attached to it. The manner and capacity of depots should be planned to provide for flexibility, should be based on available transportation facilities, and on the anticipated flow of replacements. Attachments of army postal units, finance detachments, and utility detachments to Table of Organization and Equipment replacement units are made, when necessary, in order to accomplish the assigned mission, or when replacement battalions are assigned independent missions.

A schematic chart showing the replacement flow is shown on page 33. The same facilities would be used to operate the rotation system, to retrain replacements, and to return casuals from hospitals.

Assignment of Personnel

The continuance of enlistments during an emergency is sound only if it is handled through the Selective Service System and personnel are allocated in the same manner as for inductees. Equity between the services requires that the quality and quantity of military manpower allocated to each must be consistent with the strategic role and job requirements of each. A constant cross section of the national manpower should be supplied to the Army from the beginning to the end of mobilization.

It is now apparent that the segregation of troops because of race, geographical areas, or for other reasons based on prejudice, bias, or hatred, incompatible with the concept of American democracy, results in an uneconomic utilization of manpower and is wasteful of resources and facilities. Our experience, thus far during the present conflict, with the integration of personnel according to skills and usefulness, has produced enough evidence to warrant the complete integration of Negroes, Puerto Ricans, and other minority groups in the Army.

The assignment of inductees to the branches of the Army should depend primarily on physical classification, with occupational assignments provided only for certain rare specialists. No assignment should be made on the basis of the Army General Classification Test (AGCT) score alone. Men, once assigned, who are qualified for combat or other important responsibilities, should not be kept in their old positions.

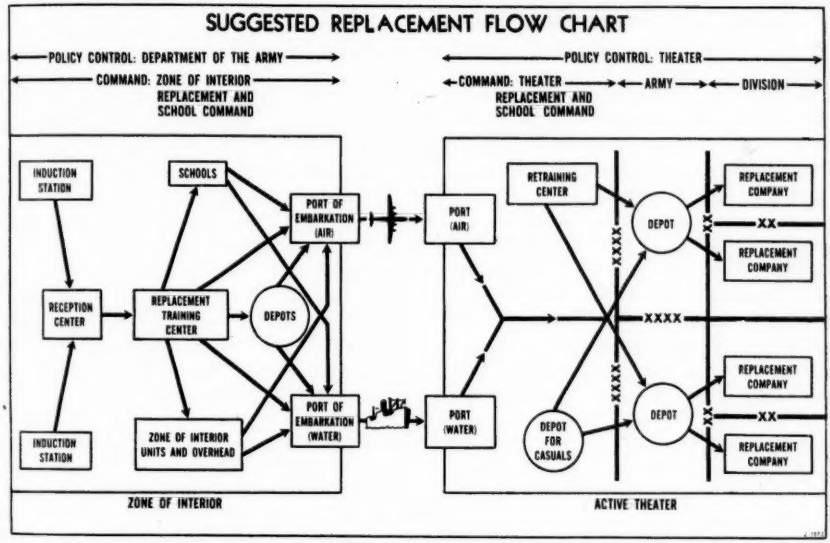
Loss Replacement Basic Data

The basic data used in computing loss replacements for each theater include the troop basis for the period, the strength and composition of forces by arm, services, and military occupational specialty, and reports of casualties. The Inventory and Projection of Army Command Strength (Report Control Symbol CSGPA-45 R2) is the Department of the Army instrument for making allocations and assignments to all overseas commands. This report is a profit and loss statement, revised monthly, and adjusted to reflect shipments made during the period. Requirements for enlisted replacements include those estimated for the third subsequent month, and estimates for officer replacements are made 5 months in advance. Replacements furnished from the Zone of Interior will not be diverted for any use

except to replace losses and to fill units authorized and scheduled for activation in the theaters.

Provision must be made in mobilization planning for an adequate replacement supply by reserving, in the troop basis, a pipe-line strength large enough to provide for anticipated operations and calculated diversions, such as officer candidate school, personnel undertaking training in service schools and civilian institutions, and operating personnel for Zone of Interior installations. Pipe-line requirements should be adequate but not excessive, for each additional increment in the pipe line requires additional operating personnel, which results in a two-fold drain on manpower. It is emphasized that personnel pools, either officer or enlisted, result in a waste of manpower, a reduction of that efficiency gained in training, and a deterioration in morale. Planned determinations of these requirements should be included in current Army mobilization programs and given specific priorities.

The magnitude of the replacement training program is apparent when experience factors indicate that one-tenth of the total strength of the world-wide division slice during full mobilization are replacements undergoing training. The significant factors are that as forces are built up during the mobilization period, the timing of equipment output must be phased with the induction of additional increments of personnel, the training of cadres, and the establishment of additional facilities.



Personnel Qualifications

An individual should be considered qualified for overseas service if he is qualified physically to perform the duties of his military occupational specialty under field conditions. In general, this requirement is met if he is found to be physically satisfactory during his training in a replacement training center, school, or unit, and subsequently has not suffered a marked physical setback or deterioration. Overseas assignments

should be established on the basis of "most nearly physical fit," rather than on skill or other criteria.

Air Shipment of Replacements

The time required for procurement and training cannot be shortened materially, and pre-embarkation furloughs cannot be eliminated, without adversely affecting morale. The most promising source of time saving lies in the use of air transport, preferably from air depots in the Zone of Interior direct to army depots in the combat area. The requirements to ship all replacements to overseas theaters by air in a major war will be 141 *C-124* aircraft, or equivalent capacity. The greatest advantage derived from this method would be the reduction of 45,000 personnel in the pipe line, flexibility due to smaller but faster shipments, and the rapid delivery of critical specialists. Some saving in time can be made through the improved planning and execution of pipeline missions, statistical reports and controls, and more accurate forecasting of requirements. The object is to have on hand, at the time of launching a major operation, sufficient replacements to fill the pipe line from the Zone of Interior to the battlefield, and to establish a theater replacement level to offset periods of large losses and irregular shipping without long delays and stagnation at any point.

Replacements deteriorate in morale and training proficiency in proportion to the time spent in the various links in the pipe line after the completion of training. By increasing the capacity of each replacement training center, advanced individual training could be continued, and the time spent in depots could be reduced or eliminated during delays in movement to air or water ports. All overseas processing should be done at the replacement training centers. All depots, both in the Zone of Interior and overseas, should operate on a short-term stockage level.

The Platoon as the Basic Training Organization

The proper size organization for training and shipping is the platoon. This unit should be organized in the first week of the training cycle when the trainees arrive at replacement training centers. At least one officer replacement should join the platoon, go through the cycle of training with it, and then the platoon as a whole should be kept together and shipped through the pipe line to a combat division. Group integrity of replacements should be maintained so as to provide for their assignment to companies or equivalent units in groups of three or more men.

Personnel remaining in overseas depots for a period of more than 10 days should be forwarded to divisions which may be assigned up to 10 percent overstrength prior to major operations. Specialists should be assigned to appropriate units as overstrength for on-the-job training, and transferred later to fill requirements.

Combat fit personnel released from hospitals, those recovered from enemy action, and stragglers should be returned to their divisions or units by the most direct and expeditious means.

The most characteristic feature of the organization for replacement production is flow, the co-ordinated movement of inductees through the replacement system. Flow plans are designed to accommodate both training efficiency and proper assignment, and to assure that cadre and training facilities are utilized to the maximum without being overtaxed. A related requirement is that the selection of trainees for specialist training be made from a group large enough to ensure the presence of an adequate number of potential specialists. Another purpose of flow plans is to produce the number of trained individuals according to established rate tables for each arm, service, and military occupational specialty number without producing too many at one time and too few at another time. The yearly production is com-

puted by multiplying the capacity times the number of probation cycles for a year and subtracting the attrition. The length of the training cycle includes the time required for the reception and shipment of trainees. As a factor of production, a 14-week training cycle must be considered a 16-week production cycle.

Basic Factors of Replacement Production

The basic factors of replacement production are the capacity of the replacement centers, the length of the training cycle, and the losses in the replacement stream. The capacity of replacement training centers is based on anticipated replacement requirements projected approximately 6 months into the future. The capacity has to be broken down between the branches and then distributed to particular installations.

The mission of the service schools will be, first, to train officers and officer candidates in branch doctrine, and both officers and enlisted men in specialist techniques; and, second, to further the development of the principles of tactical employment and special branch techniques by means of experiment, research, and study. This mission has long been established and should remain essentially unchanged throughout any future war. In an emergency, courses may be shortened and the capacity adjusted to meet anticipated requirements.

In addition to the service schools, civilian institutions should be used to meet specific needs, such as courses for specialists in the repair of railway rolling stock and Diesel engines, and petroleum refining. The use of civilian training facilities should be confined to those institutions that have specialized, technical, or other expensive equipment that would be uneconomical for the Army to duplicate.

The cadre system of furnishing a core of experienced officers and enlisted men for each new replacement center or depot enables the replacement system to expand rapidly to its wartime size with a limited number of trained men, while still maintaining operating efficiency over its installations. To enable active replacement units to provide good, qualified cadres, they must receive men with the potential of becoming good cadremen in sufficient time to allow for proper training. The best way to accomplish this is to furnish each replacement unit, charged with training a cadre, an overstrength equal in numbers to its cadre at the time of its activation.

One successful device used to obtain instructors is the leadership training program. Individuals who distinguish themselves during their basic training course are selected for further intensive training in the technique of instruction and the development of leadership. These, in turn, become instructors. In addition, efforts should be made to use individuals who have returned from overseas theaters as instructors.

A training aid center should be established under the direct control of the Zone of Interior Replacement and School Command. Training aids should be designed, produced, and issued to subcenters at all training centers. Full co-ordination should be maintained between the service schools and training centers by the Replacement and School Command relative to the standardization of methods and techniques in the use of training aids.

The operation of overseas training and retraining facilities will be a normal function of the theater Replacement and School Command. Where a theater commander can supply a part of his replacement needs from men already in his command, he can save time and shipping space and satisfy many pressing needs.

As individuals are released from hospitals, a percentage of them will be classified for duty other than combat. It should be the general policy to give on-the-job training in units for those headed for administrative and service assignments. Since all replacements will receive basic training as combat soldiers, the amount of

conversion training should be considerably less than in World War II. However, men in administrative and service assignments who are physically qualified for combat should be rotated, given refresher training as infantrymen, and sent forward as replacements. In the conversion of units which have become surplus, consideration should be given to the retraining of the entire unit rather than the transfer and training of separate individuals. This will utilize the leadership and administrative overhead of the unit to the maximum, and maintain the morale of the individuals.

Rotation

Prolonged exposure to combat and hardship results in the deterioration of the individual. The problem of rotation was recognized in World War II, but the unavailability of replacements precluded full implementation of measures to alleviate this condition. Normal persons can tolerate combat conditions for a period of 240 days, but show a decline in efficiency after about 135 days.

Ninety percent of the need for rotation lies in an infantry survival program. The solution to this problem is relief from combat and assignment to other duty in the theater after 180 days, and a Department of the Army policy for rotation to the Zone of Interior after about 3 years overseas. Temporary duty and rest camps should be utilized within the theater. Sufficient replacements should be provided from the Zone of Interior, and from sources within the theater, to support the rotation program.

Programs and Conduct of Replacement Training

Army mobilization plans provide the general scope, training objectives, and authority for the training of loss replacements.

From the training viewpoint, mobilization presents many complex problems. When our Nation is forced to mobilize, millions of men suddenly have to conform to a controlled life of co-operation, under military discipline and training, in order to develop the necessary skills useful to the Army in restoring peace. It is during the basic and advanced individual training phases that the soldier receives his first impression of the Army, and learns of his obligation to fight. No other training is more vital. The kind of start he gets will have a profound effect upon the Army in the accomplishment of its mission during mobilization and combat. The better he understands the reasons for his actions, the greater will be the likelihood of his ready adjustment to Army life and its demands upon him. While he must learn to conform to the Army pattern, observe its customs and traditions, and fit into its discipline, within these boundaries he remains an individual. He must be trained to think and act on his own initiative. He must be conditioned to withstand the fatigues of war, to shoot, march, obey, communicate, and to take care of himself individually and as a member of a team. Even though trends are toward specific skills, ground warfare still requires the maximum of physical and emotional endurance. The finest instruction is wasted unless the programs are practical and realistic, and are conducted in such a manner as to produce the best trained replacement in the time allowed.

Time Necessary for Effective Training

The most vital training question is the amount of time which should be available to institute effective training programs. Until it is foreseen whether or not considerations, due to enemy action or development of new weapons and techniques, necessitate a change in the length of each course or cycle of training, the present Army Training Programs (Mobilization), published by the Army Field Forces in the summer of 1950, represent a fair al-

lowance of time and are considered capable of producing replacements who are self-sufficient in combat.

An examination of the present training center programs shows that 25 subjects, including instruction in 8 weapons, are covered in a period of 14 weeks of 6 days each. The first six of these weeks are devoted to training in the fundamentals of basic infantry combat, to include squad tactics, and in basic subjects common to all arms and services. The last 8 weeks are utilized for specialized training in the particular arm or service to which the individual is assigned.

Reports from Korea indicate that, although replacements that arrive from the Zone of Interior are well trained and display pride and confidence, training programs of all the arms and services contain nonessential subjects and lack combat realism. Deficiencies occur in weapons training, and in basic combat techniques such as scouting and observing, outposting, selection and preparation of firing positions, defense against infiltration, and offroad mobility and maneuverability. Further training likewise is needed in the concept of the capabilities of supporting arms.

Since 3 October 1949, it has been the policy of the Army Field Forces that every male soldier, regardless of the type of duty to which he may be assigned, has, as his primary duty, the obligation to fight as an infantryman so that he will be capable of defending himself and carrying the combat to the enemy in any and all circumstances. This subsequently has become Department of the Army policy. Regardless of qualifications, every soldier must take the same 6-week basic infantry instruction. This lesson was learned the hard way, as a result of the German counteroffensive in December 1944, and in the Korean conflict, when it was proved that every man must be able to protect himself, his property, and his companions.

Branch training constitutes the remaining portion of the training center programs. Mobilization plans should fix the responsibility for the military occupational specialties to be undertaken at service schools, at replacement training centers, and in units, with emphasis on conducting such training in units to the maximum extent. The object is to keep down the number of specialist categories in the schools and training centers by producing a soldier capable of development through on-the-job training in a job area, rather than through narrow training which produces a specialist for a highly specific occupation. Combat commanders, although they receive less varieties of specialists, then can count on a steady supply of uniformly trained men with a sufficient number of high-caliber personnel.

Specialization in fields such as airborne and ranger units may be expected to expand during mobilization. Experience has shown that specialization should be curtailed in favor of unit training for conventional type organizations. However, individual replacement training must provide a flow of loss replacements for such specialized units in combat as are authorized in the theater troop basis.

To provide realism in training, conditions approximating those encountered in combat are developed through battle indoctrination courses. Combat training of this type should stress principles previously learned, and should be progressive. Accidents incurred are insignificant in comparison with the lives saved when troops become thoroughly familiar with combat conditions beforehand. These courses should be the culmination of the toughening processes, both physically and mentally, necessary to withstand the shock and exhaustion of battle. They assist the trainee to act with calmness and sound judgment during conflict.

Physical training, in the present programs, is progressive, but is beyond the

degree required both in intensity and time allotted. Physical conditioning should be related directly to the operational performances required in the ultimate assignment of replacements. To run confidence courses and conduct physical fitness marches beyond the point of practical performances, such as those required in World War II, is time consuming and detrimental to the morale of troops.

Training Must Be Practical

All instructions during mobilization should be conducted on a practical basis. The lecture method should be limited to brief familiarization talks to introduce new instructions, for review, or to clear up misunderstandings.

There are two types of instruction adapted to replacement training centers. Instruction in subjects which require personal supervision or which afford an opportunity for the development of leadership, discipline, or morale should be presented by the company, troop, or battery trainer personnel. Instruction which is technical in nature, requiring elaborate training aids, the pooling of weapons, or the co-ordination of limited facilities can and should be conducted under a committee system on the battalion or regimental level. The latter type takes training personnel away from units and should be used only if they can be spared. It was recommended earlier in this article that officer replacements should enter the training centers for training before they are moved to an overseas theater. If planned in advance, this system will provide adequate trainers to facilitate the practical use of both types of instruction. The principles and methods contained in Field Manual 25-5, *Military Training*, and Technical Manual 21-250, *Army Instruction*, are sound and adequate.

The most helpful guidance to instruction is found in the subject schedules which are annexes to the training programs. These are prepared by the service schools and revised periodically. They contain current and approved methods of instruction, and serve staffs and instructors in planning and presenting the subjects.

All instruction should be integrated to the limit permitted by local conditions in order to utilize all available time during training hours. Physical conditioning and marching can be accomplished during moves between areas and ranges. Some bivouacs can be worked in during range firing, and the final instruction in map reading can be given during tactical training time. This procedure increases interest by emphasizing the practical application of the instruction. Only in this way will commanders reach training objectives in the time allotted.

Toward the end of the advanced individual phase, training should turn to the tactical subjects, and the environment of the trainees should shift from the camp to the field. Bivouacs should be conducted under assumed tactical conditions requiring attention to dispersion, concealment, and local security measures. Frequent moves should be made to accustom individuals to rapid movements in combat. Army training programs now require approximately 35 hours of instruction during hours of darkness with emphasis on individual and unit night discipline. This is the minimum which should be provided in the 14-week training cycle.

Special arrangements should be made at each replacement training center for the training of substandard personnel. A separate battalion set aside for this purpose, with companies or platoons charged with the responsibility of giving special instruction for individuals screened because of physical, language, or educational handicaps, is a solution to this problem. Because of the time required to correct the deficiencies of these men, they should be held over for an additional cycle

of training in order to obtain the prescribed instruction.

One unit at each replacement training center should provide additional advanced instruction for personnel who have completed their cycle of training, but who may be awaiting overseas shipment.

Service schools, for both officers and enlisted personnel, play a major role in the training of loss replacements through leadership courses for officer candidates and courses for the more highly technical specialists. The programs of instruction are sound. Some subjects, although desirable, can be eliminated and the courses can be concentrated in scope and time through the introduction of longer work weeks.

Since all personnel shipped overseas as loss replacements receive the prescribed training in the Zone of Interior, the problem in the theater will consist largely of conversion and refresher training. Methods and techniques of instruction should be modified to meet theater conditions. Instructors should be selected from those who have had combat experience. Courses should be reduced in scope and time, with reliance placed upon job training where practical.

Conclusions

The adoption of the individual replacement system, rather than a unit replacement system, is sound in that a planned number of combat divisions and supporting units can be maintained in combat for protracted periods with less over-all logistic effort.

In making this decision, the Department of the Army must assume world-wide responsibility for a sufficiently rapid flow of trained officers and men to maintain all Army units in the combat areas. In order to meet this requirement, sound doctrine, organization, and procedures should be developed, included in the instruction of all service schools, and employed in current mobilization planning.

To discharge this responsibility, a Replacement and School Command should be established with control over all Army personnel not assigned to units and all pipe-line installations in the Zone of Interior, to include all service schools and training centers. This command should be on a level with the continental armies and responsible to a commander of an army group. A joint theater replacement and school command should be prescribed for each overseas combat area directly responsible to the over-all commander. Normal staff functions should apply at all echelons.

The first step in providing an adequate replacement flow would be to reserve, in the troop basis, a pipe-line strength large enough to provide for estimated requirements for anticipated operations and diversions from the Zone of Interior replacement pipe line.

The second step is a strict control over the assignment of all replacements in the pipe line, centralized in the Office of The Adjutant General.

The third step is to provide sufficient replacements to maintain the pipe line from the Zone of Interior to the combat zones at authorized levels, and to provide an overstrength of 10 percent for each combat division at the time of launching a major operation.

In order to support this program, a constant cross section of the national manpower should be supplied to the Army from the beginning to the end of mobilization. Equity between the services requires that the quality and quantity of military manpower be allocated according to the strategic role and job requirements of each. Distribution among the arms and services must be administered on a similar basis. Economic utilization of the available manpower will require a policy of nonsegregation throughout the replace-

ment pipe line. Classification and assignments in training centers should be based on physical profile and training in a job area, rather than on narrow, highly specific occupations. The more highly specialized courses, as well as formal leadership training, should be conducted at service schools. The training of specialists in units should be the normal procedure, consistent with facilities and lead time.

The present training cycle of 14 weeks is considered the minimum essential to train replacements who are competent and self-sufficient for combat in a veteran unit. The school courses, on the other hand, can be further concentrated, if necessary, in order to increase the output of trained specialists. The present Army training programs are sound, except that more emphasis should be placed on basic combat technique.

The normal overseas movement of all replacements should be by airlift in order to shorten travel time and prevent the stagnation of personnel in the pipe line.

Recommendations

The present policy, whereby the general staff carries out its responsibilities for the replacement system through normal staff functions, with the primary responsibility resting with the Assistant Chief of Staff, G1, is sound. However, it is recommended that a keener interest be taken on the Department of the Army level in the procurement of the proper quality and quantity of personnel throughout the mobilization period, based on a cross section of the available national manpower and an equitable distribution among the services according to assigned roles and job requirements.

It is recommended that the Office, Chief, Army Field Forces, be redesignated an army group headquarters with authority extended to full command over a Replacement and School Command and the continental armies; that the Replacement and School Command be established on a level with the continental armies; and that it have control over all Army personnel not assigned to units as well as pipe-line installations in the Zone of Interior, to include all service schools and training centers of the arms and technical and administrative services. It is further recommended that a joint replacement system be established in each overseas theater directly responsible to the theater commander.

When it is realized that more than 10 percent of the division slice, world-wide, is in the replacement pipe line during a major war, the importance of this system in the maintenance of forces in combat becomes apparent. It is, therefore, recommended that the positions of commanders and other key personnel, both in the Zone of Interior and in overseas replacement systems, be filled by capable, combat experienced officers of proved leadership and organizational and administrative ability.

It is recommended that mobilization plans make specific provision for the phased expansion of the replacement system including facilities, overhead, cadres, and equipment.

It is further recommended that a pipeline strength large enough to provide for estimated replacement levels for anticipated operations and diversions be provided for in the troop basis, in order to avoid the stripping of units to meet overseas requirements.

The Army training programs basically are sound but must be kept under careful scrutiny to meet conditions imposed by communistic combat techniques and conditions found in specific theaters of operation. It is recommended, at this time, that more emphasis be placed on weapons training and on basic combat technique, including scouting and observing, outposting, selection and preparation of firing positions, offroad mobility and

maneuverability, and defense against infiltration.

It is recommended, finally, that the normal movement of all replacements be by airlift from the Zone of Interior to theater or overseas army depots in order to shorten travel time, maintain constant flow, prevent stagnation of personnel, and reduce the strength and overhead of the pipe line.

The most important element of armies has always been men imbued with the will to win. And today the strength of nations is still measured by their ability to produce such men, although it depends more than ever before upon their ability simultaneously to provide the equipment with which men fight.

Democracy, more than any other system of government, has the ability to produce these two essential elements. For under democracy, all citizens have a vested interest in their freedoms which inspires the will to win. They also have a vested interest in our system of free enterprise which inspires the production of great peacetime abundance, and which, if we were threatened, could be converted to produce overwhelming quantities of the machines of war.

General J. Lawton Collins

No profession in this Nation has a heavier and more immediate responsibility than the United States Army.

Lieutenant General M. S. Eddy

Technical Intelligence in the Pacific In World War II

Lieutenant Colonel Maurice K. Schiffman, *Infantry*
Headquarters, Fifth Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN THE early months of the war, in the Southwest Pacific Areas, a neophyte was initiated into the intelligence field. This now full-fledged member of the organization—Technical Intelligence—is defined in Special Regulations 320-5-1, *Dictionary of United States Army Terms*, as: "Intelligence pertaining to the principles of design and operation, nomenclature, physical characteristics, and performance of matériel used by foreign armed forces. In a broader sense, technical intelligence may also embrace the manufacture, storage, installation operation, and maintenance of foreign matériel as well as the nature, organization, and activities of the agencies and installations in foreign ground forces having functions analogous to those of the technical services in the United States Army."

Early History and Organization

The nucleus of our present technical intelligence system was formed upon the issuance of War Department Training Circular Number 81, dated November 1942, which outlined the evacuation channel of enemy matériel, through technical service channels, from the capturing agency rearward to the chief of the appropriate service in the War Department. Likewise, it provided for the dissemination of reports forward, after preliminary analysis had been completed by the office of the respective theater chief of technical service.

The final analysis of captured matériel was performed in the Zone of Interior, again by the office of the chief of each technical service. There, the manuals and training aids necessary for the dissemination of the information were prepared. In the author's opinion, this purely technical channel, in which G2 transmitted information but had no responsibilities in the processing, was a weak link in the intelligence chain.

This condition existed until, on 3 January 1944, the six major services combined their 470 technical experts into the 5250th Technical Intelligence Composite Company (TIC), Separate (Provisional), as directed by General Order 2, Headquarters, United States Army, Services of Supply, Southwest Pacific Areas. Prior to that time, technical intelligence teams, composed of ordnance and chemical personnel, operated under the chiefs of their respective services. After the promulgation of the general order mentioned above, the chemical, ordnance, medical, engineer, quartermaster, and signal service technical intelligence experts functioned as sections—with one or more teams—during the operations in the Southwest Pacific, both in the tactical and the occupational phases. It is interesting to note that at present, a General Headquarters, Far East

Command Technical Intelligence Detachment, is participating actively in Korea.

Although this article is concerned primarily with the technical intelligence activities in the Southwest Pacific Areas, a digression to the United States forces in the India-Burma Theater (IBT) is made to emphasize the importance of the subject.

On 5 January 1945, Headquarters, IBT, issued Circular Number 1, which enumerated the over-all policy and procedure governing the collection, classification, disposition, and retention by individuals of captured and abandoned enemy matériel. Extracts from this circular follow:

I. *Recovery and Disposition of Captured and Abandoned Enemy Matériel*

* * * * *

3. Captured matériel mentioned herein will be construed to mean all enemy equipment, supplies, and documents captured or abandoned by the enemy through the activities of American troops and other troops operating under United States command or control.

4. Attention is invited to the ruling of the Geneva Convention that prisoners of war be allowed to retain their identity tags, personal clothing, and personal items of equipment such as haversack, gas mask, and water bottle. This rule will be strictly respected.

5. Captured matériel will be processed for the following:

a. Intelligence purposes:

* * * * *

8. To carry out the objective of these circulars an Allied Technical Air Intelligence Unit and the Enemy Equipment Intelligence Service have been established and are functioning in this Theater. Representatives of the several sections of these organizations will be attached to the combatant forces and commands to recover captured enemy equipment for technical and intelligence purposes and will carry out their functions with the full knowledge and co-operation of the commanders of those respective combatant units.

9. The site and location of enemy matériel will be made through Intelligence channels. Representatives of these organizations will be allowed access to any captured matériel known or stored and will be permitted to extract any or all such matériel for intelligence purposes.

10. When tactical or other conditions require *immediate action*, the following steps will be taken:

a. Captured enemy matériel will be promptly examined and new or unusual equipment will be selected and shipped.

b. A sufficient number of pieces of damaged equipment will be selected to enable reconstruction of a workable model.

c. New models of items widely known will be selected and shipped, if the new models embody significant changes in construction or performance.

* * * * *

II. *Retention of Captured Matériel Trophies by Military Personnel*

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4. . . . Captured items thought to have intelligence value will be delivered to the Enemy Equipment Intelligence Service for final clearance.

5. The following is a list of prohibited items [prohibited as souvenirs]:

a. Name plates from captured matériel of any category.

* * * * *

f. Chemicals, medicines, and medical equipment.

g. Chemical warfare equipment.

h. New types of ordnance or other equipment.

* * * * *

j. Signal matériel or equipment.

* * * * *

Operations

The basic fundamentals for the production of intelligence are equally applicable to the operation of technical intelligence. The analysis of the technical intelligence mission, the determination of essential elements of information, and the development of the collection plan were formulated on War Department and theater level. However, the collecting agencies included not only the technical experts trained in collecting, processing, transporting, and analyzing enemy matériel, but comprised tactical commanders, their staffs, and their personnel down to and including the front-line infantryman.

To follow the progress of technical intelligence from its inception to its present development, the training, organization, and operations of several of the six major technical services will be considered. (It is of interest to note that unlike the usual procedure in organizing a unit, the personnel were trained first and placed later into teams.)

The most positive and essential method for determining the technical capabilities of a potential enemy is by an efficiently staffed, effectively operated, centrally controlled, technical intelligence department

Ordnance

At the close of the Buna-Gona campaign, in December 1942, an ordnance detachment of 5 officers and 10 enlisted persons was preparing to leave the United States for the Southwest Pacific Areas. These men were specialists in ammunition, small arms, artillery, fire control equipment, and tracked and wheeled vehicles. Previous to their departure, they had completed an intensive indoctrination

The main entrance to the Technical Intelligence Center Museum in Tokyo, Japan.

in ordnance technical intelligence at the Aberdeen Proving Ground, Maryland, and in Washington, D. C.

On arrival in Australia, the detachment became operative under the technical control of the Chief Ordnance Officer, United States Army Services of Supply (USASOS), Southwest Pacific Areas, in accordance with the general policies established by the G2 of that headquarters. Initially, the technical intelligence personnel received further training and information from the Australian Army, through the Office of the Master General of Ordnance, whose extensive collection of Japanese ordnance provided training matériel and ample training aids for disassembly, study, and analysis.

To provide flexibility and ease of operations, this, the first technical intelligence detachment in the Pacific, now was organized into three sections.

The administration section, in addition to being responsible for the general supervision of ordnance intelligence activities, issued reports, maintained liaison with Australian technical intelligence organizations, collected new data on Japanese ordnance matériel, and forwarded the information to the Office of Chief of Ordnance, War Department.

The operations section consisted of field teams which operated from an advance base, or with a task force, division, or corps. Their duties included the collection, identification, preparation of preliminary reports on new items, and shipment of captured Japanese matériel to the ordnance analysis section.

The ordnance analysis section, located in Brisbane, Australia, on receipt of matériel from the field teams, analyzed and prepared reports on new items, and shipped, for training purposes, Japanese ordnance matériel to United States troops in the theater. In addition, such matériel also was sent to the Zone of Interior for technical investigation and training.

The detachment personnel were so trained that they could be used interchangeably in the three sections. For example, administrative and analysis personnel were able to move into the field, and the field teams could rotate to the rear for duty with the analysis and administrative personnel.

Chemical

In February 1942, when United States Army Forces, Far East (USAFFE), was activated, a second service set up a technical intelligence agency, namely, a chemical warfare intelligence section, which was comprised of three chemical warfare service intelligence teams.

The gradual addition of intelligence technicians in the four remaining services, details of which have been omitted, resulted in the culmination of a co-ordinated Technical Intelligence Service.

Collection, Documentation, Storage, and Transportation of Captured Enemy Equipment

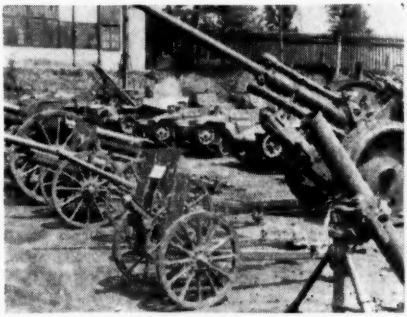
With the establishment of the quartermaster intelligence section, the chief of that section was given the responsibility for the operation of a captured enemy equipment depot for all sections of the 5250th TIC.

The depot received, classified, and maintained stock record accounts on all captured enemy equipment; delivered selected items to the appropriate service as authorized; packed and shipped to the Zone of Interior selected items as directed; maintained necessary records of the source, distribution, and totals of captured equipment by type; and returned to individuals, for souvenirs, such items as were released by the G2, USASOS.

The transportation problems became apparent when, for the first time, a chemical team, combined with the already functioning ordnance team, was attached to the S2, 12th Cavalry Regiment, for the 1st Cavalry Division's attack against the Admiralty Islands. The technical intelligence group (composed of the two teams) arrived on Los Negros, on D plus 6. They were able to reach captured and abandoned matériel dumps before the troops had time to "souvenir hunt." (Although officers from each section of the 5250th TIC previously had been sent to advance areas to inform base sections and combat troop commanders of the importance of turning in all captured matériel, with the understanding that all legitimate souvenirs would be returned, in many cases it had little effect on the willful looting and destruction of enemy dumps.) However, in this particular campaign, matériel and documents were received in quantity, and the co-operation from the individual soldiers of line units was splendid. They gave information as to the location of dumps, and proved beyond doubt that prior instruction, when given properly, as to the value of enemy equipment for intelligence purposes, paid high dividends.

The dumps located consisted of supplies and equipment of all types and services. All documents and equipment were assembled, but no attempt was made to sort the matériel, in respect to services, until it reached the collecting area. At this stage, transportation was the critical factor. Not only was land transportation needed, but, because of the insular nature of the campaign, water transportation also was essential.

The problem was solved by utilizing unloaded supply trucks that normally would be "dead-headed" to the beach. Using the same procedure with landing craft and aircraft (for more critical matériel), the equipment reached the depot at Brisbane by the effective and economical employment of transport from all services. The only disadvantage to the use of nonorganic transportation was the delays occasioned by the nonavailability of transportation when it was required.



Part of the captured Japanese ordnance equipment displayed at the TIC Museum.

Results of Operations

The medical teams collected data and published thousands of handbooks for front-line medical officers on the identification of Japanese medical supplies, and captured X-ray units and other equip-

ment then were made available for civilian use.

Ordnance units covered the largest scope of technical analysis, and commanders were able to utilize their reports on the capabilities and limitations of enemy weapons, and on the operation of captured small arms, artillery pieces, and vehicles.

Signal intelligence teams placed captured radios, and other signal equipment, with operating instructions, in the hands of United States troops. For example, a Japanese public address system was installed in a vehicle for the use of the Psychological Warfare Branch of the Sixth Army.

The quartermaster intelligence teams contributed information on the status of enemy supply, with reports on the condition of such items as raincoats and blankets which showed evidence of wear, and were evidently reclaimed, washed, patched, and reissued by the Japanese to their troops. After examination, enemy stores of food were turned over to Civil Affairs units who, in turn, distributed them to needy civilians.

Engineer technical intelligence personnel were used to remove or neutralize mines and booby traps in the forward areas. Reports on their description and methods of neutralizing, complete with sketches and photographs, were reproduced as rapidly as the situation permitted, and the information was disseminated to division G2s, and regimental and battalion S2s.

The value of the contributions enumerated above, and the demands for data on technical intelligence, resulted in the Office of the ACofS, G2, Department of the Army, publishing a nonclassified document, entitled "A Guide to the Collection of Technical Intelligence," which was issued in July 1950 for the use of all commanders.

General of the Army Dwight D. Eisenhower, in his book "Crusade in Europe," says:

> . . . Indeed one of the most important characteristics of the successful officer is his ability to continue changing his methods, almost even his mental processes, in order to keep abreast of the constant change that modern science, working under the compelling urge of national self-preservation, brings to the battlefield.

Unity of Command

The 5250th TIC had suffered growing pains, but the Admiralty campaign had proved, for the first time, that combined personnel (chemical and ordnance teams) were able to achieve wide coverage and effective results. Thus was the decision substantiated to combine all six major services, in technical intelligence operations, for the Hollandia action.

The completion of the Admiralty campaign found the technical intelligence lines of communications stretched to 2,000 miles, and authority, therefore, was granted to move the United States Captured Enemy Equipment Depot from Brisbane, Australia, to Finschhafen, New Guinea. Forward echelons moved with little delay, but the 5250th TIC, the depot, and a newly established staging area for all technical intelligence personnel did not close in Finschhafen until August 1944, where they remained until their final move of the war, to Manila in the Philippine Islands, on 12 March 1945.

Following the unity already achieved in the field, a further link was established with the appointment of the first Technical Intelligence Co-ordinator assigned to the Office of the ACofS, G2, USASOS, with responsibility for co-ordinating all technical intelligence functions in the theater. An additional officer from that headquarters was attached, with the concurrence of Sixth Army, to supervise the training programs and to co-ordinate the activities of technical intelligence personnel supplied by USASOS to Sixth Army.

The final step, and one which I believe cannot be forgotten in future planning,

was the transfer of the 5250th TIC to General Headquarters, Army Forces Pacific (GHQ, AFPAC), and the provision for the co-ordination of all scientific, technical, and technological intelligence by the ACofS, G2.

The company moved at the end of hostilities to its final home in the confines of the Japanese First Tokyo Arsenal. Here, under the directives of Major General Charles A. Willoughby, the ACofS, G2, a centralized file was established; a translation and reproduction section organized; and investigations requested on Department of the Army and theater level were completed and the results collated. A museum was established at the arsenal which included exhibits of Japanese equipment and supplies from all their services.

Liaison, by daily visits from the 5250th TIC liaison section, was maintained with naval and air force technical intelligence sections, and with the chief of each technical service in the headquarters of AFPAC.

The Future of Technical Intelligence

The principles of war have remained unchanged, but the techniques of conducting warfare have developed, by means of scientific achievement, to a degree heretofore unparalleled in history. Present and future decisions as regards the economic and manpower mobilization of this Nation must be based on a combined evaluation of what we know about our own and our enemy's capabilities.

Front-line intelligence is as indispensable as the front-line soldier. When I state that the technical intelligence operations of the future must be incorporated in the intelligence structure, from the lowest level of combat intelligence to the highest level of strategic intelligence, I make no inference that it is a substitute for either. Rather, I believe strongly that it must be considered as an important link in the intelligence chain as it proved to be in the Southwest Pacific Areas and in the other theaters during World War II.

Technical intelligence must be developed early, its personnel trained, and its collated reports integrated into the over-all strategic picture on an equal level with political and economic intelligence.

The technical superiority available to a nation in any future war will be the determining factor in the outcome of that conflict. The most positive and essential method for determining the technical innovations of a potential enemy is by an efficiently staffed, effectively operated, centrally controlled, technical intelligence department.

As a further step in establishing centralized control over technical intelligence,

A guard holding a dummy dressed in the uniform of a captain in the Japanese Army.

I would advocate a theater joint technical intelligence center incorporating the unified effort of all the services.

To illustrate further this concept of centralized intelligence control on a high level, a quotation from an Armed Forces Staff College study, "The Case for the Establishment of a Theater Joint Intelligence Center," dated December 1948, is presented:

> Apart from the Combined Operational Intelligence Center, little joint intelligence developed in theater headquarters during the war. However, in the 'Brief History of the G-2 Section, GHQ, SWPA, and

Affiliated Units' published by General Headquarters, Far East Command, on 8 July 1948, it is stressed that operational control of all related intelligence agencies or affiliates must be centralized within a theater. The writer states that while, due to the failure of the Chief of Staff, SWPA, to recognize the importance thereof, and G-2's lack of power to accomplish it on our own, it was never possible to develop a joint intelligence organization in the SWPA such as existed in the Guam-Hawaii area in the form of JICPOA (Joint Intelligence Center, Pacific Ocean Area). The advantages of such an organization were clear to the theater G-2.

Conclusions

The lessons learned and the difficulties surmounted in the evolution of technical intelligence can be summarized briefly as follows:

The demands for technical intelligence in the planning, training, and operations phase of any future engagement should be met, first, by a centrally controlled unit under the direct supervision of the G2; second, by highly flexible operations achieved through decentralization in the field, and, finally, by the provision of technical personnel trained to meet all future contingencies.

Security might be likened to a double-edged sword. Laxity in application may give the enemy the scientific advantages necessary to achieve victory; too stringent regulations, on the other hand, may prevent the continuous cross-fertilization of ideas so necessary to fruitful scientific effort with resulting slowing of progress and development so that we fall prey to an alert aggressor. The implications of atomic energy have made the need for security precautions apparent to all. In view of present international developments we shall continue to disseminate basic scientific knowledge widely, but increase protection of applied knowledge and technical information on equipment.

Lieutenant General Anthony C. McAuliffe

Real Estate in a Theater of Operations

Lieutenant Colonel Erland A. Tillman, *Corps of Engineers*
Instructor, Command and General Staff College

TO YOU, real estate probably has always meant a house and lot in town or a chicken farm in the country on which you hope to settle when you retire. However, to the Army, real estate is big business. Many of you may never have realized that the Army uses a large amount of real estate and that its needs for this property are changing constantly, needs which necessitate the Army's continuously adding to or disposing of real estate. This function is performed for the Army by the Corps of Engineers, and, in the United States, it is, of course, conducted in accordance with the applicable Federal and state laws. In wartime, the need for additional real estate is far greater than in peacetime, but the procedures involved in obtaining it are similar. They can be divided into two broad categories; it can be purchased, or it can be leased. In the United States, where most of the Army installations are more or less permanent in nature, most of the necessary real estate is purchased.

Need for Property

How is real estate handled in an overseas theater of operations in wartime? The use of real estate enters into the operations of almost every element of the theater and is of some concern to any command having area responsibility. Therefore, commanders and staff officers will have some interest in how it is handled. The assistant chief of staff, G4, has general staff responsibility for the handling of real estate and must, therefore, formulate the policies for the approval of the commander, disseminate these policies to the command, and then supervise their execution. The engineer on the commander's staff is responsible for the operating function, and must perform the tasks involved in obtaining, handling, and disposing of real estate. The administrative work involved in the allocation, acquisition, utilization, and disposal of large amounts of real estate is very heavy and will require considerable numbers of adequately trained personnel.

If the theater is large and active, the needs for real estate are great. The fighting troops cannot concern themselves with the problems of real estate or the legal rights of the owners, for real property must be taken and used, under combat conditions, as required by military necessity. This is recognized under international law. However, in a theater, a large amount of property is used under conditions where it cannot be confiscated or simply appropriated. Included in this group are the ports, depots, staging areas, training areas, rest areas, leave centers and areas, hospital areas, and headquarters areas and buildings—in short, all of the installations which make up a theater

When dealing with the problems arising from the use of real estate, the military planner must consider the type of control to be used, the political aspects of the area, and the provision of adequate personnel

and which are behind the actual combat forces. These installations often are located, necessarily, on property which is highly developed and of considerable value to the indigenous population. Some method must be used to make it available to the theater, as needed, and, at the same time, ensure that the rights of the owners are protected.

United States Policy

If the theater is not on United States soil, and in most cases it will not be, it must be located either in a friendly, liberated, or occupied country, or in some combination of these. In the case of friendly and liberated countries, the use of real estate must be covered by and based upon an intergovernmental agreement. In the case of occupied countries, it comes under international law and is interwoven closely with military government. In the past, it often has been the policy of the United States that all dealings in real estate required by the military be taken up with the government of the area concerned rather than with the individual owners. There have been exceptions to this where valid reasons existed, but it is a sound policy and should be followed in the future whenever possible.

Under this policy, the military makes known its needs to the friendly foreign governmental agency designated for that purpose, and that agency procures the property in question from the owner and makes it available to our military forces. The owner is reimbursed by his government which, in turn, is either reimbursed by the United States or, in the case of an ally, the amount involved may be included as part of its contribution to the over-all war effort. In the case of an occupied country, the procedure is much the same except that the request for property is made to the proper military government officer who either procures the property or, if the local indigenous government has been re-established, turns the request over to it for procurement. Payment is made or credit is given by the local government, and a record of it is kept so that it can be credited against any reparations at the peace settlement. In a theater of operations, little, if any, real estate is purchased. Installations are not permanent, and the leasing of the property needed is the most satisfactory method of obtaining it.

The theater commander and his staff undoubtedly are interested in real estate, particularly in the aspects which have just been described, but what of the commanders and staffs of lower commands? The theater commander will issue policies and directives for the handling of real estate based upon directives which he receives from the Joint Chiefs of Staff. He will also designate someone (his J4 or a Real Estate Allocation Board) to determine broad allocations of property between the Army, the Navy, the Air Force, and any allies who may be present. All of these will have their requirements for real estate, and their needs and desires often may conflict. The actual handling of real estate may be delegated to the commanders having area responsibility. This means that the communications zone and army commanders will be concerned with the detailed daily aspects of handling real estate. Depending upon the amount of decentralization decided upon, communications zone section, area, and district commanders, corps commanders, and, under some conditions, even division commanders may be delegated responsibility for handling real estate in the areas for which they are responsible.

Real Estate Functions

Let us consider next what is involved under each of the four headings into which the handling of real estate can be divided. These are allocation, acquisition, utilization, and disposal.

There are a vast number of agencies whose needs for real estate must be met.

Within the Army portion of the theater are all the commands, organizations, and agencies, each of which has some requirements. Very often, more than one of these groups will desire the same property. These conflicts must be resolved. Therefore, the commander having area responsibility must allocate property to the various agencies, in accordance with their needs, in a manner which will best accomplish the mission of the agencies concerned, taking into consideration the overall mission of the command. Prior planning must, of course, be accomplished in making these allocations, and the location and extent of large installations must be decided well in advance. This requires that adequate records must be kept of all allocations made and all that are proposed. In addition to this, there are always unanticipated requirements and conflicts which necessitate settlement, so allocation is a continuing function.

Steps in Acquiring Property

When a using unit has submitted a requisition for property which it needs and the allocation of property has been made to it, the property then must be secured. This acquisition includes numerous steps. First, an appraisal is necessary to determine the rental value of the property. Then comes the negotiation to obtain the owner's consent for its leasing, or the instigation of condemnation proceedings to provide for the taking of the property without the owner's consent. A "condition" survey or inventory, to record the condition of the property and to list any movable property included in the lease, must be made before the property is occupied. This step is very important as a means of forestalling or refuting unjust claims for damages when the property is released to the owner. Finally, there is the accomplishment of the lease. The property now is ready to be occupied by the using agency. All of these things take time which often can be reduced by carrying on the various steps concurrently. In cases of military necessity, provision, of course, must be made for occupying the property before any or all of the steps have been completed. Such action should be held to a minimum because of the confusion and resultant claims which invariably arise from such procedure.

Utilization Surveys

Periodic utilization surveys are necessary to ensure that using agencies do not retain property after existing and anticipated needs for it have disappeared. There is always a tendency to hold more property than is needed. If higher headquarters do not emphasize constantly the necessity for releasing surplus property, much unnecessary property will be retained at great, unwarranted expense. Not only is rental involved, but also great amounts of labor, materials, and equipment are unnecessarily expended for utilities, maintenance, and security. Accurate up-to-date utilization surveys also are valuable by making it possible for higher headquarters to fill the additional real estate needs of their lower commands. This is done by reallocating property which is ready for release by other commands under their jurisdiction. In the past, there has been a tendency to place insufficient emphasis on the utilization aspects of real estate.

Disposing of Real Estate

When the need for real estate no longer exists, its disposal must be accomplished. Here, again, several steps are involved. Improvements to the property such as new buildings, fences, utility installations, and additional installed fixtures must be removed or sold. Any improvements which are not removed must be sold to the owner, if possible, or, failing that, to someone who will remove them. In this connection, it must be remembered that often so-called improvement such as roads, walks, and hard standings are, in fact, damages from the owner's point of view because they do

not contribute to his intended use of the property. A "condition" survey must be made and compared with the one prepared before the property was occupied. Any inventories of movable property must be checked to determine what, if anything, is missing. Damages, other than fair wear and tear, must be determined. The restoration of the damages must be accomplished, or the amount of damages must be appraised and a monetary settlement, in lieu of restoration, must be negotiated with the owner. Finally, the property must be returned to the owner and the lease cancelled.

Theater Experiences

In an effort to understand some of the problems which can be anticipated in handling real estate in an overseas theater, let us consider how it was handled in some of the theaters in World War II. From the experiences of these theaters, we will endeavor to extract some lessons which may be of value in conducting real estate operations in the future. The European theater is an ideal theater to consider first, because it involved the use of real estate in all three types of territory—friendly, liberated, and occupied.

United Kingdom

At the time that United States forces first landed in the United Kingdom, Army regulations and other instructions which had been issued by the War Department concerning real estate primarily were concerned with procedures to be followed in the United States and its possessions. These procedures were not suitable for use in the United Kingdom because of lend-lease and other reciprocal aid agreements. Therefore, the necessary procedures to be followed had to be established by the theater. It was decided that negotiations with British nationals would be handled by the British Government, thereby only making it necessary for the United States forces to call on the British Government for needed properties, and to administer those properties while they were in the custody of the United States. Simple, flexible procedures based on this policy were worked out. The United States did not pay any rents. These were paid by the British Government and included as reciprocal aid. Under the provisions of the reciprocal aid agreements, the British Government also determined all prices to be paid, thereby relieving the United States forces of the considerable task of making appraisals.

The chief engineer of the theater was charged with the handling of all real estate matters in the United Kingdom. Real estate officers were designated in the offices of the engineers on the staffs of the United States base sections, and field personnel was supplied. The British War Office obtained the real estate needed by the United States Army and some of that required by the United States Air Forces. The remainder of that needed by the Air Forces was obtained by the British Air Ministry. Provision also was made for acquiring a small amount of real estate needed for special purposes directly from the owners.

The procedure used in obtaining and releasing real estate was very simple from the point of view of the United States forces. For property to be acquired by the British War Office, the unit or command needing the property submitted a requisition, through channels, to the chief engineer who then requested it from the proper branch of the British War Office. The engineers of the United States base section were kept informed of the status of the acquisition, and, when the property was available, it was inspected jointly by representatives of the United States base section and the British command concerned. This inspection was for the purpose of determining the condition of the property, after which the property was turned over to the engineer service in the base section in which it was located.

Upon receiving the property, the engineer service became responsible for its

security, a responsibility which was assumed by the area engineer. The property, in turn, was transferred by the area engineer to the using agency or unit. This transfer of responsibility was accomplished by the use of a usual type of transfer arrangement. When any property was vacated by a unit, it was relieved of its responsibility by a similar transfer arrangement. If another unit was moving in, the transfer was made direct to it; if not, the property was transferred back to the area engineer. In any event, the area engineer or his representative witnessed the transaction. When the property was no longer needed by any unit in the base section, it was reported by the base section engineer to the chief engineer of the theater who, in turn, reported it to the British War Office as being surplus. It then was inspected jointly by representatives of the British command in whose area it was located and the base section concerned. An agreement was reached as to any damage or loss sustained during United States occupancy, and responsibility was transferred back to the British.

Property which was acquired for the United States Air Forces by the British Air Ministry was handled in a manner very similar to that described above except that the theater chief engineer did not enter into the transaction. Installations were transferred direct from the Air Ministry to the United States Air Force command.

Continent of Europe

Before the continent of Europe was invaded, the handling of real estate was the subject of considerable planning. The chief engineer of the theater, who was charged with the responsibility for acquisition of all real estate, worked out detailed methods of procedure with each allied nation involved. These procedures varied in minor details, but the same principles were followed. It was decided that the United States would not purchase nor lease any real estate; that the needs of the United States would be furnished by the allied nation as reciprocal aid; that the allied nation would handle all arrangements with its own citizens; and that the allied nation would determine all prices and make all payments. These policies greatly reduced the amount of work which had to be performed by the theater.

After thorough consideration, it was decided to decentralize real estate activities and furnish trained personnel to subordinate commanders to perform the work, rather than to retain all activities under the centralized control of the chief engineer. This decision was reached because it was decided that it was more important to keep real estate activities closely tied in with operations, by giving control to the field commanders concerned, than possibly to achieve greater efficiency by using a centralized organization and having centralized control. The necessary number of officers to implement the plan fully never was obtained, so that real estate activities on the Continent always were conducted by short-handed organizations.

Real estate officers were assigned to the headquarters of the army groups and the various communications zone sections. The officers were stationed in the various key locations, as they were uncovered. These field organizations, generally known as town major teams, also were charged with the responsibility of procuring civilian labor, and were under the control of the major headquarters in whose area they were located. The lack of experienced personnel hindered somewhat the implementation of the plan for establishing additional teams as more territory was uncovered. Basically, the plan called for the leaving of a portion of the team in each of the town major offices to provide continuity while the remainder moved forward augmented by additional personnel. Because of this lack of trained personnel, it became necessary to leave real estate officers behind only long enough to orient the per-

sonnel of the relieving unit. This decreased operating efficiency considerably. The communications zone advance section town major teams, through arrangements with army and corps engineers, worked far forward into army and corps territory, thus relieving the tactical headquarters of much of the detailed work of real estate acquisition.

The procedure used in acquiring and disposing of real estate in allied countries was as follows: The using unit submitted a requisition for the property desired to the town major of the area concerned or, if none had been designated, to the engineer of the command having territorial responsibility. If the requisition did not conflict with a previous or planned allocation, a demand for the property in question was transmitted to the previously designated allied governmental agency by the town major or engineer. The allied agency acquired the property and notified the person who had placed the demand. The using unit then was notified and took possession. Upon entry, receipts and inventories were prepared either by the allied government authorities or the United States officer taking possession. Notification of an intention to vacate property was given the town major or engineer of the command having territorial responsibility, who then notified the allied government authorities. When the property was vacated, the allied government authorities signed an acknowledgement of its return.

Real estate needed for tactical purposes, of course, was occupied without formality or records. However, if it was retained after the area became a part of the communications zone, the occupancy was formalized in accordance with the procedure described above.

Each town major was authorized to regularize claims for rentals or for damages arising from the *use* or *occupancy*, by United States forces, of requisitioned real estate. If he did not approve the claim, he advised the claimant to contact the allied government authorities for the disposition of his claim. Other claims for damages to real estate were disposed of through normal claims channels.

The procedures followed in the handling of real estate in occupied countries were based upon the Rules of Land Warfare. Its acquisition was accomplished by confiscation, seizure, and requisition. Confiscation was applicable in the case of property belonging to the State, the deposed ruling party, or any agency used by either of them. Seizure was applicable to property, capable of direct military use, which belonged to individuals, or charitable, educational, municipal, or religious organizations. Requisition was applicable to all other property required by the United States forces.

The rules governing requisitions were that they would be effected only on the authority of the United States local commander, that they would be made in proportion to the resources of the country, that they would be made to satisfy the needs of the allied forces, that the supplier would be given a receipt, and that they would be carried out through municipal or other public authorities whenever it was deemed desirable. No requisitions or other formalities were required in respect to real property occupied by the United States forces unless the tactical situation permitted. It was required that records be maintained covering the use of real property, and that the owner be given written evidence of such use provided the tactical situation permitted it. The commander of the using unit was required to give notice of his intention to vacate real estate to the responsible engineer officer in advance of actual departure. No rent or other compensation was paid on requisitioned property for its use, for damage caused by the necessities of war, or for ordinary military wear and tear.

Philippine Islands

In the European theater, the fact that

the allied governments conducted all negotiations with and paid the owners for the use of real property reduced the problems of the United States military forces to a great extent. Let us consider briefly a place where this was not done, and where the military had to shoulder these additional duties.

The Philippines had not been given their independence before the war, and, technically, were still a possession of the United States. It was decided that the armed forces would lease all privately owned real property used after actual combat had ceased in an area. This entailed the actual dealing by the military with thousands of individual owners. Since the air forces were still part of the Army, and the Navy was a relatively small user of real estate in most areas, the Army was given the responsibility for all real estate acquisitions except on specified islands where it was given to the Navy. Having come from Australia where the Australian Government procured the needed property under a system similar to that used in the United Kingdom, and New Guinea and other islands of the Southwest Pacific where real estate was simply hacked out of the jungle, the Army underestimated the task to be encountered in the Philippines. The result was that the acquisition of real estate quickly fell behind requirements, and it became necessary to occupy property and formalize its acquisition later.

The General Engineer District, the engineer command of Army Forces, Western Pacific (AFWESPAC), initially was given the responsibility of handling all real estate, but soon it was decided to centralize these activities further and, on 1 July 1945, the Chief Engineer, AFWESPAC, assumed direct responsibility. At this time, additional experienced personnel were obtained, and more real estate offices were opened in the various island bases. These branch offices, though located in the bases, were responsible directly to the Chief, Real Estate Division, Engineer Section, AFWESPAC. There were 10 of these offices at the peak of the real estate program, and several of them had suboffices located in remote areas where large amounts of work were involved. Each office was staffed with several officers and enlisted men, and a large number of Filipino civilian employees.

The problem was to formalize the use of property which had been occupied and vacated, or which was still being occupied, and to acquire property to fill new needs. Much of the property consisted of small holdings, which meant dealing with a multitude of owners. Rental rate scales had been drawn up early, but holdings had to be located and appraised, owners located, negotiations conducted, and leases consummated. For property which had been vacated, damages had to be determined and an agreement with the owner reached, after which a release had to be obtained and payment effected. Simplified forms to accomplish this were devised, but performing the various steps required many manhours. Sufficient engineer effort was not available, and a policy of paying damages in lieu of physical restoration was adopted. As additional property was vacated, the value of improvements and amount of damages had to be determined, the improvements had to be disposed of by sale to the owner or others, and an agreement reached with the owner concerning payment in lieu of damages. Every effort was made to have the owner accept the improvements made to the property, in lieu of part or all of the damages, and to have him pay the United States Government the difference if the improvements were greater than the damages. When an agreement could not be reached concerning either the rental to be paid or amount of damages, the owner was free to submit a claim. These claims had to be investigated and processed by real estate personnel before being transmitted to the claims service for final action.

During the peak of the real estate pro-

gram in April 1946, when about 1,500 leases were being consummated each week, there were approximately 110 Army officers, 85 enlisted men, and 850 Filipino civilian employees working full time on real estate activities. The large amount of work did not allow a rapid reduction of this force, and, on May 1948, there still were approximately 150 American and Filipino civilians devoting full time to real estate negotiations.

Conclusions

What conclusions can we draw from the handling of real estate in the theaters of operations, in World War II, which may be of help in a theater of operations in the future?

The problem must be analized correctly during the planning stages. This is equally applicable whether the theater is being newly formed or is being expanded to embrace additional territory. The basic policies must be determined early, for all subsequent plans will depend on them. If other than United States military agencies are to determine rentals, negotiate with owners, execute leases, and evaluate and settle damages, the problem is far smaller than if all of these functions are to be performed by the military. In a friendly foreign country, it is, undoubtedly, most desirable to have the foreign government conduct all dealings with the indigenous owners. However, this may not always be possible.

After the problem has been analized and the basic decision is made as to how much of the work is to be handled by the United States forces and how much by others, it is necessary to decide whether centralized or decentralized control is to be exercised. The advantages of more uniform standards and the greater efficiency which can be achieved under centralized control must be weighed against the advantage of providing a quicker response to the operating needs of the using units, which best can be achieved under decentralized control. If many of the functions are to be performed by other agencies, as was the case in the European theater, decentralization of control to commands having area responsibility seems feasible and desirable. If the military must perform all or most of the functions, and must deal with the individual owners, centralized control becomes highly desirable.

Whatever the previous decisions, the promulgation of a detailed standing operating procedure and the formulation of simple standard forms for accomplishing the various necessary actions are imperative.

A shortage of necessary experienced personnel can handicap seriously and may even jeopardize the success of any program for the handling of real estate. Personnel is such a vital factor that every effort must be made to provide it as needed. If experienced personnel are not available, other personnel must be obtained and trained before being used in key positions.

Logistics in Mobile Defense

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN AN article entitled "Mobile Defense" appearing in the May 1951 issue of the MILITARY REVIEW, Lieutenant Colonel Robert J. Hoffman discussed the tactical aspects of the defense on a wide front. It is the purpose of this article to examine some of the logistical problems facing the commander and the staff of a division in the same defensive situation.

In the defense of a wide front, the conduct of logistical operations in support of the combat forces and the defense of rear installations become problems of major importance. This has been amply demonstrated in the Korean conflict. The extensive use being made of the helicopter and the airplane for the logistical support of our forces in Korea gives evidence of the effect which enemy action may have behind our lines.

Our doctrine states that in the defense, logistical installations are placed farther to the rear than in the offense, in order to protect such installations from minor penetrations of the defensive area. This is an accurate statement, but it does not give the complete picture.

Location of Installations

In any situation, three major factors determine the location of logistical installations.

First, is the ability of the installations to perform their support missions. As applied to the defense, this factor alone may preclude locating the installations far enough to the rear to protect them from enemy penetrations of the area.

Second, is the defensibility of the installation. Some of the division logistical installations occupy more area than others; some are more (or less) vulnerable because of the nature of the supplies or services which they provide, or because of the troops which man the installations. It is far easier to select the location of the division replacement company than it is to locate the division Class III dump.

Third, is the requirement for dispersion. In the face of a threat of bombardment by mass-destruction weapons, the need for dispersing logistical installations is obvious. Even if no mass-destruction weapons are being employed, the possibility of air attacks normally requires the dispersion of logistical installations.

In the defense of a wide front, the three

Advance planning and co-ordination are necessary to solve the logistical problems attendant to a mobile defense: dispersion, the movement and location of supplies, and defense of rear area installations

factors mentioned above are in greatest conflict. The techniques involved in a mobile defense visualize the occupation of critical terrain features which will be prepared for all-round defense, recognizing that mutually supporting fires between these organized localities will be sacrificed. The resulting dispersion of the combat troops, therefore, results in a greater number of areas to be supplied, longer distances to be traveled by supply vehicles, and affords more opportunities for the enemy forces to infiltrate into the rear areas.

In such a situation, the G4 and the special staff are faced with locating the division logistical installations in such manner as to maintain the best possible balance between the three conflicting factors. Their decision must be based on a careful evaluation of:

1. Our own situation.
2. The enemy situation.
3. The terrain.
4. The road net.
5. The type of installation.
6. The troops manning the installation.

Proposed Solutions

Let us then consider some of the possible solutions.

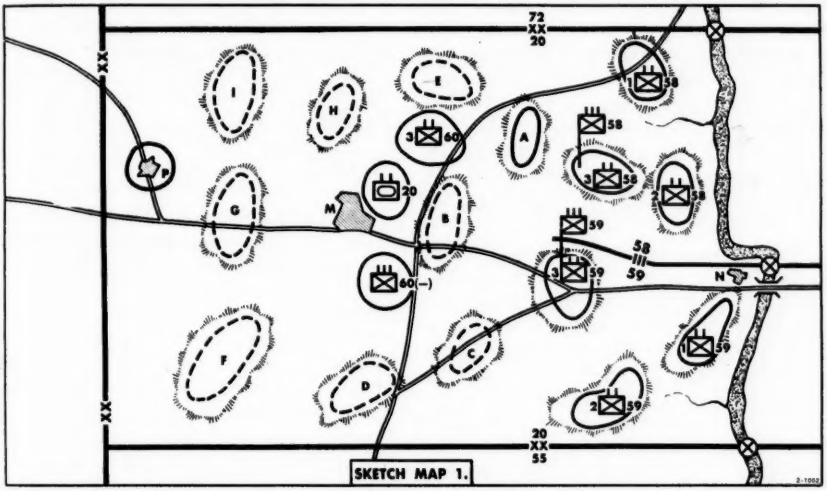
One solution is to place all the logistical installations within the several localities being organized for all-round defense by the combat forces. This will give the maximum protection to the logistical installations. However, it may result in congesting the defended localities and most certainly will place service units in locations where they cannot perform their support missions expeditiously and efficiently. This solution is unsound in most, if not all, situations.

The next solution is to assemble the logistical installations in the rear areas of the division sector where the possibility of interference by enemy ground action will be minimized, and where the service troops manning the installations can support each other against ground attack. This solution may produce lack of dispersion and may place some installations too far to the rear to perform their missions adequately. It is workable, however, under circumstances such as existed initially in Korea, where the enemy air capability was nonexistent but his capability for ground attack by guerrillas and partisans was being exploited fully.

A third solution actually is a compromise of the two preceding. Some of the logistical installations in the division, such as water supply points and bath units, are not large and they can perform their mission best by being close to the troops which they support. These installations can be placed within the localities defended by combat troops, or in such proximity to those localities that they are protected against enemy action. The other installations are placed in the rear areas in such surroundings as will permit the maximum self-defense and the accomplishment of their support mission, and yet provide dispersion. A suggested grouping might be to place the quartermaster installations in one area; the ordnance, engineer, and signal installations in another area; and the medical installations, the rear echelon of the division headquarters, and the replacement company in a third area. These suggested groupings, in effect, divide the service elements of the division into three functional groups. The quartermaster area is predominantly a supply area, the ordnance-engineer-signal area generally is devoted to maintenance, and the third area generally is administrative. The formation of these groups results in flexibility in the location of the logistical installations, facilitates the accomplishment of their mission, and provides some dispersion against mass-destruction weapons.

Security of Logistical Installations

It is axiomatic that all commanders are responsible for the defense of their own commands. This applies equally to the division logistical installations as it does to the front-line infantry battalions. However, the problems attendant to the self-defense of logistical installations are more complicated than those arising from the defense of an area occupied by combat troops.



This sketch indicates the tactical dispositions of the 20th Infantry Division, which has been assigned the mission of conducting the defense of a wide front. The commander has decided to employ two regiments in the forward portions of the battle position. Positions have been selected and prepared for the reserves so as to protect the critical terrain and provide a base for counterattacks. The division reserve is located so as to facilitate the implementation of future actions.

First, we are faced with the fact that the mission of the logistical installations, and the troops which man them, is the support of the combat elements of the division. Therefore, the time and effort devoted to preparations for defense can become very limited.

Second, is the matter of training. Although every effort is being made in the Army to train every individual as an infantryman, the fact remains that the training of service units is, of necessity, slanted toward their particular specialty. For example, an ordnance company cannot be expected to engage in combat with the teamwork and finesse of an infantry rifle company.

Third, is the matter of equipment. With the exception of the engineer battalion, the service units of the division are not armed to conduct anything more than a limited defense of their installations .

With these facts in mind, the commander and the staff of a division engaged in the defense of a wide front must take the necessary steps to ensure the security of the division logistical installations.

The first step to be taken—the proper location of these installations—has been discussed before. We might add here that the judicious selection of the terrain to be occupied by a logistical installation will increase its ability to defend itself, and

may reduce the over-all effort required by the division in organizing its sector. Such is the case when the logistical installation is placed within an area being organized for eventual occupation by combat forces in the event of a forced withdrawal of part of the division.

The next step to be taken is to provide the necessary technical assistance and staff supervision to ensure that the rear installations are organized properly for defense. Assistance may have to be rendered by engineer troops in the laying of barbed wire, the installation of warning devices, and in the siting of mine fields. Staff supervision is required to ensure that the policies of the division commander are carried out.

Third, a commander must be designated for each area in which the logistical installations are located. Just who is designated will vary with the circumstances. In some divisions, this may be a matter of standing operating procedure. In other cases, the senior officer present in each area will be designated. Or perhaps, as may happen in the area occupied by the rear echelon of the division headquarters, the officer with the best combat experience and training will be responsible for defense of the area.

The fourth step, and probably the most important, which the division commander and his staff must take to ensure the security of the division logistical installations, is the preparation of plans to destroy any enemy force, regardless of size, which has penetrated into the rear areas. These plans must include the action to be taken by the installation under attack, by other installations in the vicinity, and by the division reserves or other combat units which may be in a position to move against the attacking forces.

Allied to these plans for active operations against enemy forces in the rear areas will be plans for the protection of supply convoys. It can be expected, during the conduct of a defense on a broad front, that partisans, guerrilla forces, or small infiltrating parties will make every effort to disrupt our support of the front-line forces. It is imperative, therefore, that all convoys moving in the division sector be ready and able to cope with ambushes or other forms of enemy attack. In most cases, this will require escorts, preferably from the armored elements, to guard and protect the supply convoy. It also will require strict co-ordination between the G3, who will provide the escorts, and the G4, who must plan and organize the logistical operations.

Logistical Operations

The commander and the staff of a division assuming the defense of a broad front are faced with various conflicting problems in the fields of transportation and supply.

The techniques of conducting a defense on a broad front require the organization of critical terrain features which may be considered as the bastions of the defense. Between these organized localities, there will exist many wide gaps which are covered, to the maximum extent possible, by fire, outposts, reconnaissance patrols, and by the extensive use of artificial obstacles. It can be seen very readily that the organization of such a defense sector requires a tremendous amount of fortification material, especially barbed wire and mines. The problem of hauling the large tonnages involved is complicated further by the relatively great distances to be covered and the many different points at which the supplies must be spotted. The solution to the problem requires close co-ordination between the G3 and the G4, who must provide the commander with plans and recommendations for the organization of the sector. These plans will involve the:

1. Establishment of a strict priority for the preparation of defensive works.

2. Establishment of several temporary

engineer supply points convenient to the combat troops preparing the defensive works.

3. Co-ordination and control of the use of available transportation.

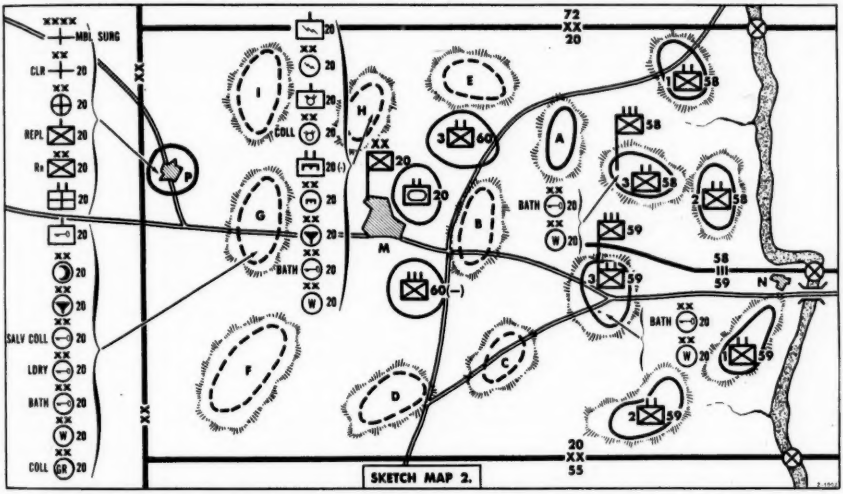
4. Co-ordination and control of the use of available manpower, to include civilian labor.

During the conduct of a defense of a

required will consist of ammunition, rations, and water.

2. Obtaining from higher headquarters the necessary authority to draw ammunition in excess of basic loads, and to obtain equipment in excess of tables of organization and equipment allowances, such as water cans.

3. Drawing the extra supplies and mov-



To obtain dispersion and still provide for maximum mutual support, the division logistical installations are grouped into three general areas, taking advantage of critical terrain being prepared for defense and deriving incidental protection from adjacent combat troops.

broad front, the organized defensive areas must be held even when surrounded and cut off by enemy forces. It is imperative, therefore, that steps be taken, during the organization of the division sector, to prepare these strong points to resist under such circumstances. For the commander and his staff, particularly for the G4, this means the solution of logistical problems not usually encountered in the position defense. The solution to these problems will involve:

1. Determining the types and quantities of supplies to be stocked within the organized localities. Usually, the supplies

ing them to the proper places within the division sector. This will have to be coordinated with the movement of fortification material.

4. Preparing plans for emergency air resupply of surrounded defense areas. This will require close co-ordination with higher headquarters. The organization of helicopter companies within the Army simplifies greatly the planning and execution of such action.

Conclusion

It has been the purpose of this article to high light some of the logistical prob-

lems which have to be solved by the commander and the staff of a division defending on a broad front. Because of the nature of such an operation, certain logistical matters assume greater importance than when the division is on the offense, or is engaging in a position defense.

Several points have been emphasized in this discussion. Among them are:

1. In locating logistical installations, the G4 and the special staff must arrive at the best possible balance between the highly conflicting factors of dispersion, defensibility, and the ability to carry out the supporting mission.

2. The inherent weaknesses and limited capabilities for defensive action by service units require that the commander and his staff exert close supervision over their preparations for defense. In most cases, their preparation will require assistance from the other units of the division.

3. The defense on a broad front creates additional requirements for transportation and supply. Therefore, careful advance planning and co-ordination, on the part of the division staff, are prerequisites.

NEXT MONTH

Main Articles

The Arctic Can Be Our Ally by Lieutenant Colonel Joseph J. Peot; and *Planning An Airborne Assault* by Lieutenant Colonel Jay W. Herrington are included among the main articles.

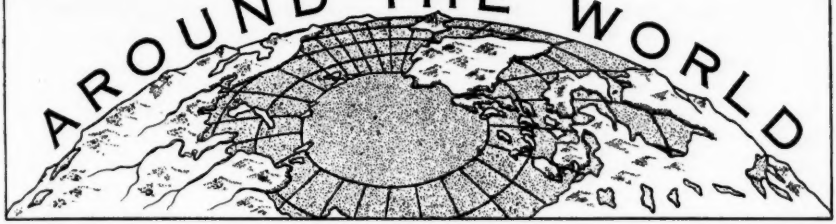
Foreign Military Digests

The foreign digests include "Interallied Military Co-operation" from *Defesa Nacional* (Brazil); and "Atomic Power for Aircraft" from *Canadian Aviation.*

Books for the Military Reader

Reviews of *The Serviceman and the Law* by Colonel Morris O. Edwards and Colonel Charles L. Decker; and *The Purse and the Sword* by Elias Huzar are included.

MILITARY NOTES AROUND THE WORLD



UNITED STATES

Chemicals Aid Treating of Wounds

Chemicals made from the juice of germs are aiding the treatment of Korean war wounds.

A recently developed powder, produced from liquid "enzymes" given off by streptococcus germs, provides a new aid in the clearing of blood clots, dead tissue, and pus from war wounds. The powder itself is free from any infectious properties.—News release.

Benzene From Shale Oil

Benzene, an important chemical in the manufacture of synthetic rubber, can be obtained in large quantities from the same Colorado oil shale that is now producing heating oil and gasoline. This shale also will yield other important chemicals such as solvents, waxes, asphalts, and tars.

Benzene is one of the strategic materials now in short supply. During 1950, the United States used approximately 190 million gallons. While the larger part was used in making rubber, much was employed in making synthetic phenol for plastics, analine for dyes, in nylon, DDT, aviation gasoline, detergents, solvents, and many other products. The demand for benzene is far greater than the present supply.—*Science News Letter.*

'Knee-Action' Trousers

A new type of Army field trousers for wear in temperate, wet-cold, or Arctic weather has been developed by the Quartermaster Corps. The new garment has been dubbed "knee-action" pants because of extra pleated material over the knees. This permits freer motion by the wearer than the present field trousers, especially when other clothing is worn beneath them. The new trousers will become a part of the combat uniforms when supplies of the present field trousers are exhausted.—*Army Navy Air Force Register.*

How Many Planes in a Group?

Plans for expanding the Air Force, as presented to Congress by Air Force officials, refer to requirements in terms of "groups." How many planes are there in an Air Force group?

The number varies according to the group's function, as follows: tactical fighter-bomber groups—75; day interceptor groups—75; all-weather interceptor groups—36; tactical reconnaissance groups—54; strategic reconnaissance groups—30; troop carrier groups—36 or 48; heavy bomber groups—30; medium bomber groups—35 (also, in some cases, 20 tankers for flight refueling); and light bomber groups—48.—*Science Digest.*

Germ War Defense Organized

The United States Public Health Service has created a new "epidemic intelligence service" to help stand guard against biological warfare attacks.

In peacetime, the epidemic intelligence officers will co-operate with state and local health officials in investigating ordinary outbreaks of disease. Moreover, the establishment of the new organization will ensure an important defense corps in case a potential enemy may seek to employ biological warfare.—News release.

'Robot' Weather Stations

Daily weather information is transmitted across the frozen waste of the Arctic region by a "robot" weather station that performs all weather observations, with the exception of measuring the ceiling and horizontal visibility, without the aid of technical or maintenance personnel.

The first Air Force "automatic weather station" was placed into experimental operation recently on Amchitka, a deserted island in the Aleutians. This "station," which replaced five trained weather technicians and additional staff members, is 50 times more powerful than any unit used previously, and has been tested at temperatures as low as 30 degrees below zero, and in 180-mile-an-hour winds. Resembling an oversized truck, the equipment housing is 12 feet long and 6 feet wide.

A self-winding clock operates the meteorological instruments for a 3-month period before servicing is needed. However, the Air Force hopes to increase this self-sufficiency period to 12 months.

The "robot" transmits its weather observations by Morse code through a programming unit which sends the information in established sequences.

Successful operation of this unit may result in similar units being placed in the polar region, where weather stations operated during the last war have since been abandoned.—*Armed Force.*

Arming MSTS Ships

One-third of all Military Sea Transportation Service vessels will be armed by the Navy during the current fiscal year. In addition, 59 transports are to be altered over an extended period of time to improve troop-carrying capacity. —*All Hands.*

Blood Counts

Rapid mass blood counts will be possible with a red blood cell counter developed at Cornell University under a Naval Research project. Using the new instrument with "production-line" methods, three technicians can perform 40 to 60 counts an hour as compared with the present rate of about 12 to 14 an hour. Since there is no dilution of blood and the quantity used is not critical, errors in visual blood counting methods are avoided in the new instrument.

Under battle conditions, mass blood counts are vital in estimating damage resulting from hemorrhage, shock, flash burns, and exposure to ionizing radiations. This method also will help in routine blood counts and in screening men for military service.—*MSTS Magazine.*

Airplane Speed Indicator

Airplane speed is measured directly with an instrument based on a new principle, using ionized air reference regions on the wing of the plane. The instrument also indicates the nature of the airflow over the airfoil and the approach of pressure of a stalling condition.

The instrument includes an electric pulse generator for intermittently ionizing, or electrically charging, the air in the airstream to form segments of ionized air in the stream. A timer connected with the generator operates in the intervals between the pulses. The timer works in co-operation with sensing elements located downstream which detects the ionized segments.—*Science News Letter.*

Substitute Materials

Chemistry is providing substitutes for some of the war-scarce materials that are creating industrial shortages.

More than 2 million pounds of metallic copper annually are being saved by the substitution of organic chemical compounds, the dithiocarbamates, for copper used as an insecticide in orchards. The same chemicals also are saving 4 to 7 pounds of sulphur for every 100 gallons of insecticidal spray.

Gypsum, one of the oldest minerals known, is now yielding sulphur in countries that do not have resources of elemental sulphur of pyrites.

In addition, calcium sulphate is being turned into sulphuric acid and ammonium sulphate for fertilizer use.—*Science News Letter.*

X-Ray Studies Improve Concrete

X-ray diffraction is being used by the Army Corps of Engineers in its study of new methods of producing better quality concrete at a minimum cost.

Studies by various laboratories indicate that X-ray diffraction methods are valuable in identifying, classifying, and analyzing the materials used in concrete construction. The apparatus used by the Army Engineers is designed to be used either for making photographic records of X-ray diffraction patterns or for the direct recording of diffracted rays on a strip chart.

A notable feature of this mechanism is its ability to obtain diffraction data from small samples weighing only a few hundred-thousandths of an ounce. This permits the selection of tiny portions of finely grained materials such as admixtures for concrete, cements, hydrated cements, and clays for study purposes. Some of these materials could not otherwise be studied and identified by ordinary miscroscopic or chemical methods.—*Armed Force.*

Optimum Caliber Project

One of the many spectacular testing programs carried on at the Aberdeen Proving Ground is the "optimum caliber" project. In this test, various types of aircraft—generally World War II vintage planes which are war-weary and no longer air worthy—are suspended by steel cables between a pair of 125-foot towers, and experimental explosive charges set off under them.

An explosive charge being set off under a plane at the "optimum caliber" test site.

The planes can be placed at various heights and in almost any desired position, and thus become realistic targets for testing and research purposes.

Through this project, the Army Ordnance Corps is able to evaluate, to an extremely fine degree, the destructive ability of a particular experimental explosive against various types and models of aircraft. At the same time, experts from the other services are detailed to evaluate the damage done, so that they are able to provide information relative to improvements in aircraft design.—News release.

Television Landings

The Navy has disclosed that its new giant carrier, the *Forrestal*, will use a secret television system to help planes land on the deck. The 59,000-ton craft is expected to be completed in about 3 years.—News release.

Malta Based Squadron

The Navy has announced that a patrol squadron of *Privateer* aircraft would be based on the British island of Malta to strengthen allied Mediterranean air defenses. The squadron will operate independently with the powerful United States Sixth Fleet, which is assigned to the Mediterranean.—News release.

'Mothball' Ships

The combat reserve ships in mothballs have not only paid off in national security but have saved the taxpayers millions of dollars. Preservation and maintenance of 2,036 ships since the program was initiated has cost approximately 60 cents for each thousand dollars of the original cost of the vessels.

Since the beginning of the Korean conflict, more than 300 vessels have been reactivated and placed in commission. It is planned to raise this to a total of 381 by the close of the current fiscal year. The estimated replacement cost of these 381 vessels would be approximately 5 billion dollars at present prices. The cost of activating these vessels will total approximately 120 million dollars, or slightly more than 2 percent of replacement costs.—News release.

Airplane Parts Tested

As many as 3,000 X-ray photos are made daily in a West Coast aircraft plant in testing metal parts before they are assembled into an airplane.

Magnetic tests also are used, and sound waves, too high in pitch to be heard by the human ear, are employed to detect hidden flaws deep inside metals.

All raw materials, parts, and assemblies received from suppliers and subcontractors are subjected to various tests before they are used in an airplane. This assures that they reach the high specifications required in the construction of a sturdy plane.—*Science News Letter.*

Ranger Training

Ranger training will be incorporated into all combat elements of the Army's divisions, with the ultimate purpose of having Ranger-trained men in all units.

Army training has traditionally included scouting and patrolling. However, the decision to incorporate Ranger training within combat units of standard divisions is an innovation designed to build each man to the top of his capabilities as an individual soldier. Experience has shown that the effectiveness of a soldier increases in direct proportion to the degree of his confidence in his equipment, his leadership, and, most important, his own ability. Ranger training is designed to develop this confidence.

The training will be conducted at Fort Benning, Georgia, and personnel completing the course will be returned to their parent divisions to spread their knowledge and skills through the unit.—*Armed Force.*

Combat Veterans for Guard Divisions

Substantial numbers of combat-tested troops from Korea will be assigned to civilian component units (National Guard and Organized Reserve Corps) called to active military service in the future, according to a Department of the Army announcement.

It is contemplated that between 4,000 and 6,000 rotated enlisted men, mostly noncommissioned officers, will be assigned to the 37th and 44th Infantry Divisions, both National Guard units, scheduled for active service early this year.

A majority of those troops will have returned from the Far East Command; a few will come from other oversea theaters.

Heretofore some Korean combat veterans have been distributed among civilian component units in service, but a lack of sufficient numbers of battle-trained troops prevented full implementation of the plan until this time.—News release.

Cold Weather Boot

A new insulated rubber boot that protects its wearer from freezing temperatures as low as 45 degrees below zero is expected to reduce the number of frostbite cases in Korea this winter.

The new boot, which will replace the shoe-pac previously used by troops in Korea, was developed by Army, Navy, and Marine Corps research teams. It operates on the principle of sealed insulation, similarly to the thermos bottle.

Marine "guinea pigs" tested the boot in artificially produced subzero temperatures by freezing a cupful of water in the shoe, donning frozen socks, and walking around in the boot until the ice melted and warmth was restored. The entire process took only 8 minutes.—*Armed Force.*

Oil Re-refining Program

The black, sludgy, used oil drained out of aircraft engines in reality is "liquid gold" for the Air Force.

Through a re-refining process, approximately a million gallons of used aircraft engine oil was put back into use during the past year. In addition to saving valuable natural resources, the re-refining program also represented substantial financial savings.

So successful is the program that the Air Force now is planning to expand it to include the re-refining of used oil drawn from ground equipment.

The re-refining process brings used oil back to a condition equal in all respects to the characteristics of refined crude oil. The technical method, equipment, and control employed by re-refiners are comparable with those of crude oil refiners. The specifications for the finished re-refined product are identical with those of crude oil refineries. Inspection tests have revealed that some of the physical properties of re-refined oil are superior to those of refined crude oil.—Air Matériel Command.

Sapphire-Powered Bomber

American-built *Sapphire* turbojet engines will furnish the power for the twin-jet *B-57A Canberra,* one of the United States Air Force's newest bombers (MILITARY REVIEW, Jan 1951, p. 69, and Oct 1951, p. 67).—News release.

Armed Forces

In proportion to population, this country had more men in military service on 30 June 1951 than any of the Western European countries receiving United States aid. On that date, the United States had 21.2 men in active military service for each 1,000 population.

Figures for other nations were: United Kingdom 15.7, France 17.8, Italy 6.5, Belgium-Luxemburg 12.2, the Netherlands 9.7, Norway 9.7, Denmark 6.3, Portugal 10.6, and Europe over-all 12.6.

The figures for the percentage that could be mobilized in 90 days were: the United States 27.3, United Kingdom 39, France 27.5, Italy 11.8, Belgium 18.5, the Netherlands 17.5, Norway 68.5, Denmark 20.6, Portugal 29.4, and Europe over-all 25.8.—News release.

Controls Mission

The Economic Co-operation Administration is sending a mission of experts to Western Germany to help tighten controls on exports of strategic materials into the Soviet bloc. The foreign aid agency stated that United States help was requested by the West German Government.—News release.

Sun-Powered Motor

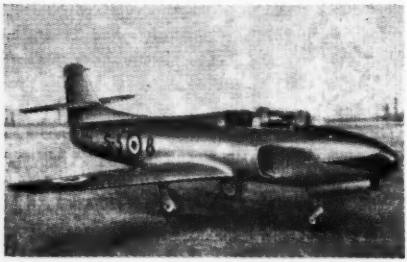
The General Motors Corporation recently unveiled a sun-powered motor, but conceded that a sun-powered automobile might be 100 years away.

The present motor develops only enough fractional horsepower to spin a balsawood disk by means of photoelectric cells that turn the sun's rays into electrical energy.—News release.

ITALY

Jet Fighter

Italy has produced a new single-engine jet fighter—the Fiat *G. 80*. It features swept-back wings and tail, a pressurized cabin, and tricycle landing gear. The plane is produced in two models, the *G.*



Italy's new Fiat *G. 80* jet fighter.

80-1, with a De Havilland *Goblin* jet engine, and the *G. 80-2*, with a Rolls-Royce *Nene* jet engine.

The *G. 80-1* has a maximum speed of 546 miles an hour and a maximum range of 1,120 miles. The *G. 80-2* has a maximum speed of 571 miles an hour and a maximum range of 715 miles.—*Rivista Aeronautica*, Italy.

ARGENTINA

Receive US Cruiser

The former United States light cruiser *Phoenix* was commissioned recently as the Argentine ship *17 de Octubre*. The 10,000-ton ship takes its new name from the date in 1945 that Juan Perón emerged as a leader.—*The New York Times.*

URUGUAY

Adopt Swiss System

A constitutional reform abolishing the presidential system of government in favor of a nine-man federal council on the Swiss model was approved recently by the Chamber of Deputies.

The new council is scheduled to take office on 1 March.—News release.

EL SALVADOR

United Nations' Aid

Some 25 experts of the United Nations and its specialized agencies arrived in this Latin American country recently to assist with studies being made of commerce, transportation, communications, agriculture, industry, education, public health, social welfare, taxation, and the national budget.—*The New York Times.*

BELGIUM

Steel Process

A quick and inexpensive method of converting pig iron into high quality steel, by blasting it with oxygen-enriched air and superheated steam, was described recently by a scientist from the University of Liege.

While admitting that the new process is more expensive than the Bessemer method of producing steel, the scientist said that it was less expensive than the open hearth process.—*The New York Times.*

JAPAN

Barter Proposal

Japan recently offered Asian nations a barter deal to build trade and industries in the Far East and bring Japan raw materials. Under the proposal, Japan would supply capital goods and technical skill to aid industrialization of Asian nations in return for raw materials, particularly rubber and tin.—News release.

IRAN

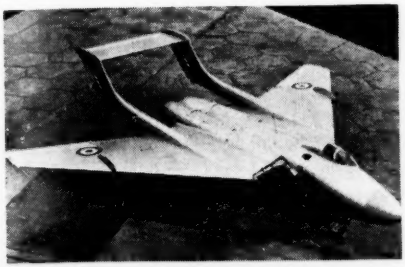
German Embassy

The United States has turned over to the Iranian Government the German Embassy building which has housed the US Embassy since the end of the war. It will be held for the Bonn Government which is expected to re-establish a mission in Iran in the near future. The United States Embassy has moved into a new 3 million dollar, two-story brick building on Tehran's outskirts.—News release.

GREAT BRITAIN

Jet Fighter

Great Britain has shown an impressive array of new jet aircraft during the past few months, and wraps have now been taken off another model—the De Havilland *DH 110* jet fighter. This plane is the first



The new *DH 110* jet fighter.

of a new class of day and night fighters. It is fitted with two Rolls-Royce *Avon* jet engines, and is built on the twin-boom principle, with sharply swept-back wings. Performance data on the new plane have not been released.—British Information Services.

Aircraft Carrier

Britain's largest aircraft carrier, the 36,800-ton *Eagle*, under construction since 1942, recently joined the Royal Navy.

The new ship has a crew of more than 2,000 men and officers, and will carry 100 aircraft, including the Navy's new *Attacker* jet fighter.—News release.

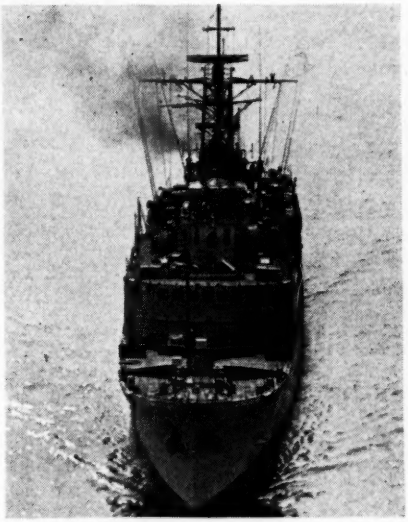
Curb Communist Goods

Great Britain recently closed a gap in the net spread to stop strategic goods from getting to the Communists. The Board of Trade has announced that it will control transshipment of strategic goods and materials, including arms and ammunition, in British ports.

Previously, permission to transship goods was automatic, without formal control by the British authorities.—News release.

Atom-Age Ship

With the end of World War II, it became obvious that new techniques for naval warfare would have to be evolved to cope with the increased development of submarines, guided missiles, and rocket-firing equipment. To aid Royal Naval research in antisubmarine warfare, the Admiralty has converted the former fleet



Britain's atom-age ship—the *Relentless*.

destroyers *Relentless* and *Rocket* into antisubmarine frigates.

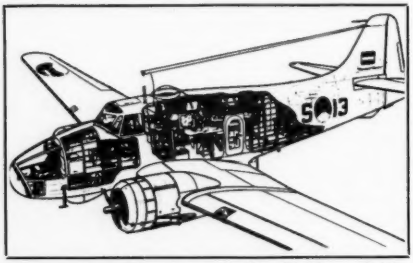
These ships present new features in warship construction; the conventional bridge has been removed and the hull has been streamlined. In action, practically everyone would be under cover, and the captain would "fight" the ship from the operations room, with a periscope giving him all-round view of the area around the vessel. Both of the new conversions are equipped with the latest antisubmarine weapons and detection devices.—British Information Services.

THE NETHERLANDS

Aircrew Trainer

The present emphasis on aircrew training, as part of the vast preparedness effort, lends special significance to the introduction of the Dutch Fokker *S.13 Universal Trainer.*

The new plane is designed to train pilots, navigators, radio operators, and



A cutaway drawing of the Fokker *S.13.*

bombardiers as a team. Alternatively, it can be used for aerial survey or for a light transport or liaison aircraft.

The *S.13* is an all-metal, low-wing, twin-engine monoplane, with retractable tricycle landing gear, and will accommodate a crew of six.

It can be fitted with either wheels or floats, and has a maximum speed of 220 miles an hour, a cruising speed of 196 miles an hour, and a maximum range of 1,200 miles.—*Canadian Aviation.*

INDIA

Industrial Controls

Parliament recently approved an industries development and regulation bill vesting the Government with wide powers to recast the industrial pattern in accordance with the country's 5-year plan.

The bill specifies that 37 categories of major industries shall be controlled directly by the Government, while all other industries will be regulated by Government-sponsored development councils and the Central Advisory Council.—*The New York Times.*

WESTERN GERMANY

Plan Larger Fleet

Western Germany intends to increase her merchant fleet by 160,000 gross registered tons in small and middle-size ships during the next 2 years, according to an announcement by the Transport Ministry. —News release.

Displaced Persons

Up until 1 August 1951, the United States Displaced Persons Commission had resettled 256,426 individuals in America, and an additional 12,000 displaced persons had been issued visas and were awaiting transportation.

More than 75,000 applications were on file with the commission on 31 July 1951, the registration deadline. Of that number, only 35,000 can be granted visas under the provisions of the displaced persons act.—*Information Bulletin:* (Office of the US High Commissioner for Germany).

AUSTRALIA

Aerial Prospecting

The Australian Government is going to use a magnetometer installed in an airplane to extend its search for oil.

The device, which measures terrestrial magnetism, will be used to discover rock formations hundreds of feet underground. —*The New York Times.*

Power Ships

The New South Wales Electricity Commissioner has advocated the use of power ships as a means of overcoming electricity shortages in Sydney.

The power shortage in New South Wales will not be overcome for another 2 years, and in Victoria and Queensland there will be power difficulties for a longer period. Australia now has 27 million dollars worth of power equipment on order in the United States, of which 1½ million dollars worth is on its way to Australia.—*Australian Weekly Review.*

COMMUNIST CHINA

Airfield Rehabilitation Program

Extensive preparations are under way in Communist China to strengthen that country's air power. Part of this program includes rehabilitating and lengthening airfields, which were built by United States, Japanese, and Chinese forces during the last war, so that they will accommodate jet aircraft.—*Aviation Age.*

Foreign Trade

About three-fourths of Communist China's foreign trade now is being conducted with the Soviet Union and Soviet bloc countries.

An announcement from Peiping stated that 77.94 percent of Communist China's exports is going to the Soviet Union and the "peoples' democracies," while 70 percent of its imports is coming from the Soviet bloc. No volume or value figures were given on the extent of this trade, which is believed to involve the exchange of China's agricultural products and strategic metals for machinery, finished goods, and oil.

The Soviet Union is currently using 51.51 percent of Communist China's exports and providing 44.7 percent of its imports. Aside from Communist China's basic economic agreements with the Soviet Union, it has negotiated commercial pacts with Czechoslovakia, Hungary, Poland, Eastern Germany, and North Korea.—*The New York Times.*

Pilot Training Program

The Soviets have taken over the direction of the pilot training program of Communist China's Air Force. The practice is to fly a Soviet air division of 130 to 160 planes into China and then begin integrating Chinese pilots from training schools. Eventually, they replace the Soviets, except for a few specialists. Similar methods are being used to build up the Air Force's maintenance and communications services.—*Aviation Age.*

KOREA

Ship Transfer

The United States Navy recently transferred two patrol frigates—the *Hoquaim* and the *Tacoma*—to the navy of the Republic of Korea. The 2,200-ton ships each carry a complement of 10 officers and 132 men.—News release.

Winter Combat Suit

British troops battling Korea's cold this winter have had an ally in a newly designed combat suit for use in extremely cold weather. The outer garment is gabardine lined with wool, and the detachable hood has a wire framework which can be adjusted to shield the face from the wind. The complete outfit, including a new type boot, weighs less than 20 pounds.—British Information Services.

The new cold weather combat suit.

USSR

Raw Materials

The President of the Soviet Academy of Sciences recently announced that the Soviet Union now had every raw material it needs inside its own frontiers.—News release.

Electric Power Production

The Soviet Union will have to almost triple its electric power production by 1960 if it is to achieve Stalin's long-range economic objective.

In his major postwar address of 1946, Stalin indicated that at least 250 billion kilowatt hours of electric power would be required annually to meet anticipated production in 1960. Soviet electric power output in 1950 was only 90 billion kilowatt hours.

Even if it should achieve the calculated objective, the Soviet economy still would be producing much less electric power than the United States produces. In 1950, United States utilities and industrial installations generated more than 370 billion kilowatt hours of electric power.—*The New York Times.*

Reversing Rivers

A Soviet engineer has announced that "several score" engineers were helping him draw up plans for a grand hydroelectric-irrigation project to turn the flow of three of Siberia's greatest rivers from north to south and irrigate Central Asian deserts.

The engineer envisages the irrigation of 60 million acres of arid but fertile land and the watering of possibly 84 million additional acres of pasture land. The combined area would be almost the size of Ohio, Indiana, Illinois, Michigan, and Kentucky together.

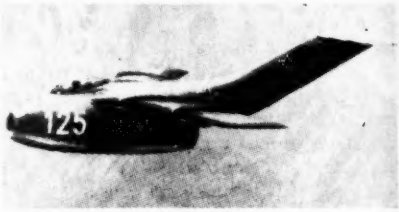
The plans provide for a dam 250 feet high across the Ob River, just below its junction with the Irtysh River, to form a reservoir covering 96,000 square miles—about the size of Oregon.—News release.

Soviet Jet Fighter

One of the latest designs turned out by the Soviets probably will be known to the Western world as the *MiG-19*. Its lines follow closely those of the German *Ta-183*, developed late in World War II.

Performance, dimensions, and power plant are unknown at this time, but the plane is believed to be in production.

Late in World War II, the Soviets captured the most advanced models of the



The new Soviet *MiG-19* jet fighter.

Ta-183, and undoubtedly have worked hard at improving the performance of the design.

The German-built *Ta-183* had a design speed of about 600 miles an hour, could approach 50,000 feet, and had a range of more than 1,300 miles with a jet engine of less than 3,000 pounds thrust.

The plane should be capable of much higher speeds, if powered by one of the engines the Soviets are producing today—engines capable of 8,000 to 10,000 pounds of thrust.—*Aviation Age.*

Civil Guard United

The Soviet Union recently merged the three civilian defense organizations of the Army, Navy, and Air Force.

The new group, known as the "Volunteer Society for the Aid of the Army, Air Force, and Navy," is expected to eliminate parallelism in leadership; strengthen the ranks of the organization; and improve the military, athletic, and educational work of its members and the population as a whole.—News release.

Clausewitz and the Cold War

Digested by the MILITARY REVIEW from an article by Major General B. T. Wilson in "The Royal Engineers Journal" (Great Britain) September 1951.

KARL von Clausewitz's first writings about war were in the form of short essays; complete within themselves, but with very little connection with one another. These essays were considered "grains" of knowledge, interesting in themselves and of value to those experienced in war. Later, he developed these "grains" into his famous treatise *On War*, which a reader not yet acquainted with battlefields would be able to read with profit. Clausewitz stated that he wanted to write a book that "would not be forgotten in 2 or 3 years, and which would be opened more than once by anyone interested in war." His aim has been amply realized, for it is nearly 120 years since the book was first published and it is still very much alive.

Who Reads Clausewitz?

Soldiers and statesmen on the Continent have studied it with great attention, and often seem to have based their conduct of land warfare in accordance with the same principles which it lays down. However, British soldiers do not appear to delve into Clausewitz with much enthusiasm; that is, if the English translation in a famous military library is any indication of reader interest. Of the three volumes in this English translation, Volume I has been taken out 18 times, Volume II 12 times, and Volume III only 10 times in 18 years! As Volume III contains the chapter "Plan of a War," it is evident that we do not tend to plan wars: we rather prefer to have wars thrust upon us.

Learning the Phenomena of War

However, for those who do plan wars, Clausewitz is a veritable feast. One can well imagine Hitler browsing through its pages during the enforced leisure of his imprisonment after the Munich "Putsch" (Hitler made a reference to the "great Clausewitz" in his final testament to the German people, dated 29 April 1945). The stern-faced members of the Politburo possibly open the book occasionally to see whether it throws any light on their problems of war and peace. It might even happen that the "why" or the "wherefore" of such strange phenomena as the "war of nerves" and the "cold war" would be explained by reading carefully through *On War*.

At first sight, this would not appear to be very probable, because, although the threat of war constantly has been used to gain political ends without fighting for

them, there is something quite novel in the scale and scope of the two procedures. They are, moreover, quite different from each other.

Hitler was able to whip up the well-educated German people to a state of almost hysterical enthusiasm for war, and when he threatened, the tension was great, and the issue of peace or war hung by a thread.

However, the less-educated peoples of the Soviet Union seemingly are not consumed with any burning enthusiasm to embark on a war of aggression. They appear to be obedient but passive. Their leaders, so far, have acted with great deliberation, both in pursuing political aims and in resorting to force. The extreme tension of Hitler's "war of nerves" does not suit the endless patience of the Russian temperament. A Russian objective seems to be pursued on an extremely long-term basis, regardless of setbacks and repeated failure. The possession of the Crimea had been an ambition of centuries before it finally was acquired from the Turks. The "Russification" of Eastern Siberia and Central Asia has been a very gradual achievement, more like the slow advance of the tide than the furious beginning of a storm.

Clausewitz, who was for many years in the Russian service, makes an interesting comment on Poland, which he mentions as an exception to the usual rule that a nation defending itself in Europe generally can rely on foreign aid in the preservation of its sovereignty:

> Long before the partition of Poland, the Russians had *penetrated* the country and the idea of its independence had ceased. Had it not been partitioned, Poland must have inevitably become a Russian province. There is as little to cause wonder in the noiseless downfall of Poland as in the silent Russian conquest of the Crimea Tartars.

Poland, to all intents, finally has become a Soviet province, but it has taken a long time to bring this about. Therefore, seen in historical perspective, there is nothing really new in the Soviet "cold war," which is the old patient penetration procedure, quickened by the cataclysmic disturbances of the times.

Therefore, there may be passages in Clausewitz which do illuminate some of the puzzling aspects of the "cold war." However, before proceeding to examine them, a glance at some of his basic concepts is advisable, for they run like a thread through the whole of his treatise.

Basic Concepts

"War is a mere continuation of policy by other means."

This famous concept requires little comment. It seems obvious enough now, but it was a novel idea when it was written. Even in 1914-18, friction between statesmen and soldiers was more pronounced than a fuller understanding of the axiom would have permitted. In the last war, the political leaders of the warring nations exercised a tight and vital control of higher strategy. Such control is certain in the total warfare of the future.

"The defensive is in itself stronger than the offensive."

This concept seems, at first sight, to be contradictory, especially after a war which rewarded the offensive with such overwhelming victories. Clausewitz points out that if the offensive were the stronger form of war, all would attack and there would be no defensive. He considers the "state of expectancy" of the defense to be its great advantage, for it wards off the blow and then strikes back. In decisive war, there is no question of passive defense. The American conduct of the Korean conflict is a classic example of the correct use of the defensive. One can feel sure that Clausewitz would have admired it.

"There may be wars of all degrees of importance from a war of extermination down to the mere use of an army of observation."

To this concept might be added *or even*

to the threats of war implicit in a so-called "war of nerves" or in a "cold war."

"Although there are many ways to one's object in war, the destruction of the enemy's armed force is always the superior and more effectual means, to which all others must give way."

War which goes headlong for a decisive result cancels out the lesser forms.

Having thus mentioned the four main concepts of Clausewitz's philosophy of war, the way is clear for some ideas which bear particularly on the present-day "cold war."

Ideas Bearing on the Cold War

"Most reports are false, and the timidity of man acts as a multiplier of lies and untruths. Everyone is inclined to magnify the bad in some measure."

The Iron Curtain prevents the West from acquiring a true picture of the Soviet Union. The "fog" of the "cold war" is one of its chief features. Reports about the military strength of the Soviet Union may be greatly exaggerated.

". . . Even the final decision of a whole war is not to be regarded as absolute. The conquered state often sees in it only a passing evil."

Germany thought like that after 1914-18. Her present prostration is the root cause of the "cold war."

"The political object as the original motive of the war will be the standard for determining both the aim of the military force and also the amount of effort to be made."

The political object of the Soviet Union is to spread communism throughout the world. This brings them into conflict with political opponents who, together, are larger and potentially more powerful. Even the conquest of Europe would not end the struggle. Therefore, the required effort is enormous.

"War does not spring up quite suddenly: it does not spread to the full in a moment."

The "cold war" has been going on for several years and has not, as yet, spread to the full.

"A system of terror is not at the command of any but a revolutionary government."

Karl von Clausewitz
1780-1831

This has a familiar ring!

"As soon as either one of the two parties proposes to himself a new positive object and takes active steps toward it, even if it is only by preparations, and as soon as the adversary opposes them, there is tension of powers. This lasts until the decision takes place—that is, until the party either gives up his object or the other has conceded it to him."

It would be difficult to set down a better description of the course of the "cold war."

The Question of Numerical Superiority

"Superiority in numbers is, in tactics as

well as in strategy, the most general principle of victory."

"We may search modern history in vain for a battle in which an army has beaten another double its own strength."

"At certain periods in history, a superiority in the organization and equipment of an army has given a great moral preponderance."

"The weaker the force the more moderate must be the object it proposes to itself and the shorter time it will last."

Even in the atomic age, superiority of numbers may continue to be a decisive factor, but the question of how best to use it in a global war is difficult to answer.

"If the offensive should discover some new and powerful element which it can bring to its assistance, then the defense must again alter its method."

Air power and armor are potent new elements which are developing to their full potential. Therefore, the defense must be planned in great depth using "hedgehogs" and lines of obstacles to unbalance the attack, in order to produce favorable conditions for a large-scale counteroffensive.

Peace versus *War*

"A conqueror is always a lover of peace: he would like to make his entry into our state unopposed. It is precisely that side which has to defend itself which should always be armed against surprise."

The Soviet-sponsored "peace declaration" bears this out. Therefore, the West should be strong enough to counter any surprise actions.

"The offensive need not be the easy and certain form of war, which it is in the gloomy imagination of those who can see only helplessness and apathy in the defense."

Troops likely to be thrown on the defensive should be taught, in peacetime, that by defending initially they will be in a better position to eventually defeat the enemy.

"Formerly fortresses were only built for the defense and protection of the inhabitants. This use of fortresses has been too little regarded in modern times. If there was a country in which not only all great and rich cities, but all populous places as well, were fortified and defended by the inhabitants, the talent as well as the force of will of the enemy's General would sink to nothing."

Home guards and "hedgehogs" come to mind on reading this paragraph.

"The retreat into the interior of the country should, as a rule, be made directly before the enemy, and as slowly as possible, with an army which has not suffered decisive defeat and is undivided."

Cf. Korea.

"Unless the defender has an immediate great decision in view, he is obliged to take his measures the sooner of the two, which gives the assailant the advantage of playing the last hand."

After Korea, what?

What Is To Be Attained?

"No war should be started without first seeking a reply to the question 'What is to be attained by it and during its course?'"

The Soviet Union would find this question most difficult to answer.

"If policy is grand and powerful, so, also, will be the war, so that it may be carried to the point at which war attains its absolute form."

It would be difficult to describe as "grand and powerful" a policy which finds expression in such measures as the Berlin blockade, in niggling there over transportation details, in the petty use of the "veto," and in the incitement to war of puppet states. Such a policy is opportunist and naïve rather than grand and powerful. In fact, it would be difficult to imagine a course of action more calculated to alarm the Western world and more certain to force it to take measures to defend itself. Conceivably, the Soviets are in a sea of troubles themselves and desire to add to those of the West, without any intention of

becoming involved themselves in a real war which they definitely know would be a "total" war.

"Russia can only be subdued by its own weakness and the effects of internal dissention: the country must be agitated to its very center."

Judging by past history, the thing *not* to do is to march on Moscow!

"An attack designed to destroy the enemy which has not the boldness to shoot like an arrow directly at the heart of the enemy's power can never hit the mark."

"When an object at the very beginning of a war is beyond our strength, it will always remain so. . . . There is only one result in absolute war and that is the final result . . . The more necessary it is not to take the first step without reflecting what may be the last."

It is to be hoped that the rulers of the Soviet Union will think over these wise remarks and not adopt the attitude of Hitler, who, when he had made war with Poland, Great Britain, and France inevitable, exclaimed "No matter! The Germans have everything to gain by war and nothing to lose." Seldom has a prophet been so wrong!

A Plan for War

Clausewitz ends his treatise with a sketch plan of campaign for a war against France waged by Austria, Germany, the Netherlands, and England. There now is no great interest in his plan, but two of its details are worth mentioning.

The first one is that Switzerland is allotted the role of a neutral that can look after herself with her own forces and that her country would be a useful *point d'appui* on the upper Rhine. Switzerland has carried out this role very adequately during several large wars during the last hundred years and seems likely to continue to do so. At the present time, she is in the process of equipping herself with a large number of medium tanks and seems fully aware of what might again be required of her.

The second point related to the English Army, and suggests that only half of it should fight on the Continent and that the other half should be retained in England to threaten a landing on the French coast. This, says Clausewitz, would keep two or three times as many French troops busy at coast defense.

It is significant that Clausewitz should make this suggestion, as there is only one other mention of the sea in his book and that is to remark, when discussing the subsistence of armies, that war tends to fix itself along high roads, near populous towns, in fertile valleys, or *along such sea coasts as are well frequented!*

Clausewitz an Objective Thinker

Clausewitz seems, in fact, to have avoided thinking about sea power, although he must have noticed how his hero Napoleon was thwarted in his ambitions by the English fleets. This absence of reference to the sea seems to show that he was not a man of action who thought deeply on how to dominate the world. He was not, in fact, even a good commander of troops, but, being of a philosophical bent, was content brilliantly to analyse the land warfare which, for so many years, he had seen with his own eyes unfolding itself on the battlefields of the French revolution and Napoleon. No glorification of war is to be found in his book nor is he a special advocate of the offensive and nothing but the offensive. His treatment of war is severely objective. He had no scruples about the planning of aggressive wars, and it would have seemed to him absurd that one day it would be considered criminal to do so. Decisive war was to him "an act of violence pushed to its utmost bounds," which is probably what it will continue to be.

Individual Antitank Combat

Digested by the MILITARY REVIEW from an article by
Captain Arkady Romanowsky in "The Irish Defence Journal" (Ireland) July 1951.

Written by a former Soviet Army officer, this article describes Soviet methods (individual action) of stopping and destroying tanks.—The Editor.

THERE is a Russian folk saying that the devil is not as terrible as he is purported to be. This same concept could be well applied to the tank.

The advantages that a tank possesses are counterbalanced, to a great extent, by many disadvantages, namely:

1. It is easily seen and heard, though it itself is half blind and deaf.
2. It is a difficult weapon to conceal, because of its size.
3. It has less mobility than a man, and its movement is influenced, or even restricted, by the terrain over which it is operating.
4. Its fire is inaccurate and scattered on the move, and in a still position it presents a good target for enemy weapons.
5. It is surrounded by a dead area, uncovered by fire from its guns.
6. It is inflammable and easy to set on fire.

When one considers these disadvantages, it is obvious that the best way to fight a tank is not to run, which would only provide a better target for the tank's weapons, but to find cover and prepare for an assault on the tank.

Assault Methods

What, then, are these methods of assault, and how can they be best applied?

When a tank has been spotted, it is an easy job to tie three or four hand grenades together and throw them under the tank tracks. Of course, this will mean that the person throwing the grenades must remain concealed until the tank is within easy throwing distance. If successful, the tank tracks will be destroyed or badly damaged, and the fighting power of the tank will be lost. Antitank or antipersonnel mines, dynamite, demolition blocks, or bombs may be substituted for hand grenades.

A bottle of inflammable liquid is a good offensive and defensive weapon against tanks. By placing a rag or cotton stopper in the bottle, igniting it as the tank approaches, and throwing it against the tank, the infantryman has an effective weapon that is certain to stop most types of tanks.

By fastening wire hooks to smoke pots, and then hurling them onto the tanks, the infantryman has another weapon that is almost as dangerous to a tank as fire. These hooks often will catch in a slit or the smoke pots will remain suspended to some protrusion on the body of the tank. The smoke penetrates through every slit and fills the body of the tank, remaining inside long after the pot itself has stopped smoking. The driver and the entire crew are not only blinded, but suffocated as well. Their only road to escape is to open the turret and stick their heads out for fresh air. They are no longer capable of fighting.

A Wartime Experience

This particular method brings to mind an incident that happened in my unit during the last war. One of my sergeants came face to face with an enemy tank as he was standing by a 45-mm gun which he was repairing. As soon as the tank saw the gun, it advanced immediately, firing its machine guns at the gun and the sergeant. He jumped into a slit trench just as the tank ran over the gun. However, after running over the gun, the tank started skidding and its speed was reduced, which gave the sergeant time to jump on top of it. There ensued a run-

ning fight between the crew of the tank and the sergeant, whose sole weapon was a pistol. He first leaned over and fired into the vision slit, but it was protected by bulletproof glass. This increased the sergeant's rage, so he tore off his blouse and set fire to it with his cigarette lighter. As soon as it was ablaze, the smoke rapidly spread over the tank and started seeping in through the slits. The tank soon was so full of smoke that the driver could no longer see where he was going. The underbelly of the tank struck a rock, half mounted it, and left the tank threshing the air with its tracks. The crew, sneezing and coughing, threw open the turret and surrendered; an object lesson of how an ordinary blouse beat the armor of a tank.

Additional Assault Methods

If a shelter half is available, it can be put to good use. Thrown over the turret or in front of the vision slit, it will blind the tank and deprive it of its combat efficiency. If a shelter half is not available, a blanket or field coat can be used effectively.

Another good weapon for antitank combat is a cleaning rod, sharpened to a point, or any other piece of stout metal wire. This, of course, applies only to hand-to-hand fighting with a tank, and then only if one has succeeded in climbing on it. With such a weapon, the driver can be incapacitated through the air vents, which usually are placed over his head. Other slits also may be found to overcome the crew in a like manner. It also is possible to fire a pistol through the air vents, or even to introduce the muzzle, minus the foresight, into the inside of the tank.

Another method of combating tanks is to tie mines or grenades to a long piece of wire and stretch it between two slit trenches. Thus, two men, one in each trench, can wait for a tank to approach, and then move the explosives into its path.

Tank Destroyer Courses

At the beginning of the last war, large numbers of German tanks inflicted heavy losses on the resisting Soviet Army. In order to fight the tanks successfully, the Soviet Army organized special "tank destroyer" courses. The most daring and physically fit men were selected for these courses and instructed in the various methods of individual antitank combat mentioned above. This policy produced excellent results, and it may be said that toward the end of the war the German tank ceased to be an object of terror.

The techniques of leadership are many, but one of the most important is to tell the soldier the why of things. It is my firm conviction that the American soldier is a better fighting man when he knows the reasons behind his need to serve.

General J. Lawton Collins

'They Did Not Understand the Sea . . .'

Translated and digested by the MILITARY REVIEW from an article by Edmond Delage in "Revue Militaire Suisse" (Switzerland) August 1951.

THIS reproach, addressed by Tirpitz to the German people, at the end of his memoirs, could have been applied to Hitler. This is the principal fact that one obtains by reading the notes that were taken at the *Führer's* conferences with his naval chiefs.

Notes Amplify History

The commanders in chief of the German Navy, Raeder, until January 1943, and afterward Doenitz, were in the habit of taking notes at these conferences, and, later, after amplifying them, of filing them in their archives. These notes escaped destruction, thanks to the prompt intervention of allied intelligence officers, and were later translated in their entirety by the British and American naval authorities.

They reveal the basic gaps in the Hitlerian mentality, which was of an incredible audacity, responsible for several major and original decisions, but irremediably limited in the matter of naval strategy.

It is obviously impossible to summarize, here, the 500 pages of text, in which we find presented, almost week by week, all the problems raised by the general conduct of operations. One finds there, for example, all the reports submitted by the principal chiefs of the Navy and, at times, the Army, for the examination of the *Führer*, whether at the time of the projected invasion of England, the attack on Norway, or during the different phases of the submarine war.

Mediterranean Plans of Interest

Of all these plans, the majority of which were either halted or abandoned before being put into action, there are none more interesting, in retrospect, than those relating to the Mediterranean. It is on this point that most of the fundamental differences between Hitler and Admiral Raeder were expressed.

Even though Raeder had never been favorable to Operation *Seelöwe*, destined for triumphing over Great Britain by a crossing of the Channel and a landing in Southern England, he, on the other hand, advocated a much more energetic and venturesome strategy in the Mediterranean area.

The Importance of Gibraltar and the Suez Canal

During the early part of September 1940, when Hitler was beginning to realize the necessity for attacking Russia and "immediately" reinforcing the Eastern front, Raeder was submitting concrete propositions to him for intervention in the Mediterranean. In his eyes, Gibraltar and the Suez Canal were of decisive strategic importance in the German-Italian war. Raeder declared that "control of the Mediterranean zone" was of vital significance to the Axis powers in Southeastern Europe, Asia Minor, Arabia, Egypt, and Africa. It would ensure inexhaustible sources of raw materials, and the loss of Gibraltar would provide crucial difficulties for the highly important British traffic coming from the south. In addition, the preparations for such an operation should be terminated before the intervention of the United States. If undertaken, it would be one of the hardest blows that could be dealt Great Britain.

In the same document (6 September 1940), Raeder stressed the great value of Dakar and warned against possible British or American occupation of the Azores and the Canary Islands in the event that Spain or Portugal entered the war.

Operation *Felix*

On 26 September 1940, realizing the at-

traction that the invasion of Russia had for Hitler, and knowing that the plans for the invasion of England had been abandoned, Raeder attempted to interest the *Führer* again in Operation *Felix* (the taking of Gibraltar) and in an offensive against Egypt and the Balkans. Admiral Raeder stated that Germany must carry on the war against Great Britain with every means at her disposal, and that this must be done before the United States would be able to intervene effectively.

Other Strategical Concepts

Other points brought up by Raeder at the same conference included: (1) the Mediterranean question must be settled during the winter months; (2) Gibraltar must be taken, and the Canary Islands dealt with by air action; (3) the Suez Canal must be seized (he stated that the Italians did not appear to be capable of this by themselves, and that, if accomplished, the Germans could then advance from Suez to Turkey); (4) that with this accomplished, the Russian problem would present itself in a different light, and an invasion from the north then would not be necessary; (5) that the Dardanelles problem would be similar to the Russian problem; (6) that it would be easier to supply Italy and Spain; (7) the protection of the East African areas would be ensured; and (8) the Italians could carry the war into the Indian Ocean; and (9) a feint operation could be undertaken against India.

To Raeder, the West Africa problem apparently was of no less decisive importance. He believed that Germany should undertake an operation against Dakar, base air forces at Casablanca, and cooperate with France for the protection of the African northwest.

No Approval From Hitler

However, the *Führer* reacted but little to these suggestions. He wavered between co-operation with France and co-operation with Spain "who asked a great deal (French Morocco) but offered little." He hesitated to free supplementary naval forces at Toulon, and pretended that he had to discuss the matter with Mussolini before deciding. In reality, he was obsessed by his prejected invasion of Russia.

On 14 November 1940, Raeder stated that the occupation of Gibraltar and the domination of the Western Mediterranean, as important as they were, would not be sufficient. He said that control of the Eastern Mediterranean was of "indispensable urgence" from both a strategic and political point of view for the continuation of the war. Such a course of action would permit the elimination (perhaps even the destruction) of the British fleet in the Mediterranean zone. Germany could not remain a "disinterested spectator" because of the connection which existed between the Mediterranean-African problem and the victorious war which was being waged by Germany.

On 18 March 1941, Raeder broadened still more his strategic ideas. He proposed plans to protect the French Empire against a British-American attack, and against De Gaulle, and to exploit the France-African zone and its bases in the interest of the German air, ground, and naval forces.

The Invasion of Russia

Finally, on 22 June 1941 (in spite of 5 weeks' delay created by German intervention in the Balkans because of the Italian defeat in Greece), Hitler carried out his great plan, *Barbarossa*, against Russia. Everything had to be sacrificed for it.

During the afternoon of that historical day, Hitler conferred with Raeder, Keitel, and Jodl, and expressed his desire "to avoid any possible incidents with the United States" until he could see his way more clearly in the development of the

operation. However, the *Führer* did not abandon entirely his plans for an attack on the British positions in the Mediterranean and Asia Minor.

Other Operations Considered

Three operations were considered: the first against Egypt, from Libya; the second against Asia Minor, starting from Bulgaria and passing through Turkey; and the third against Iran, starting from positions which were to be seized in Transcaucassia. The *Afrika Korps* and the *Luftwaffe* were reinforced, and the German Navy was ordered to co-operate with the Italians and to prepare the necessary transportation.

Raeder's Maritime Concepts

Raeder continued to press the *Führer* to support France in her effort to maintain her hold in West Africa, but Hitler did not attempt to conceal his distrust. Finally, on 13 February 1942, Raeder, in full favor with the *Führer* after the skillful return of the *Scharnhorst*, the *Gneisenau*, and the *Prinz Eugen* from Brest to Germany, took advantage of the situation by presenting his maritime concepts to Hitler. Raeder stated that the Baltic and Black Seas were zones where German naval power could be employed effectively in support of the offensive against Russia. British naval power in the Mediterranean was greatly compromised as a result of the Atlantic campaign, the Japanese attacks in the Far East, and the German concentration in Norway. However, victory in the Mediterranean depended, above all, on the capture of Malta. The Strait of Gibraltar once closed, Egypt and perhaps the Persian oil fields captured, contact could be established with Japan. However, it appears that these were Raeder's last strategic concepts.

Fleet Action Abandoned

Following the failure of the *Lützow* and the *Hipper's* attack on a convoy bound for Russia (31 December 1942), the *Führer* ordered the disarmament of the large vessels. Raeder abandoned his command on 30 January 1943, and was replaced by Doenitz. Everything was now subordinated to the submarine campaign.

Raeder had not been able to overcome the *Führer's* deep-rooted distrust in the line vessel and the aircraft carrier. His surface units, which had been decimated, were never again used in offensive operations. Control of the seas was abandoned to the allies.

Soviet Design and Research

Digested by the MILITARY REVIEW from an article in "Aviation Age" (United States) July 1951.

THE Soviet's capabilities and intentions are revealed to a limited extent by the emphasis she has placed upon different areas of research between 1945 and 1950. By considering four marked phases of effort in relation to the Soviet Union's over-all research progress in aeronautical and scientific matters, a general estimate of the situation can be attempted. These include:

1. *A defensive build-up* immediately following the war with hurriedly improvised jet fighters such as the *Yak-15* and *MiG-9*, in which Soviet-developed German turbojets were hung onto conventional airframes. Later, within this period, a less-hurried development of cleaned-up German wartime craft such as the *La-15* (*Me-262*), the purely Soviet "pod-and-boom" *MiG-11*, and the *Thunderjet*-resembling *Yak-17* model.

2. *A consolidation of uplift facilities*,

with a parallel *development of the first jet bomber types.* With an urgency designed to bolster war-torn surface transport and provide lift for the military, the *Il-12*, *Il-18*, and *Tu-70* were developed in quick succession. The jet bomber models produced during this phase included the four-engine *Il-16* and twin-engine *Tu-4* and *Tu-8* for medium-range and ground-support operations.

3. *A second period of fighter concentration* on advanced models with more powerful turbojets and rockets and swept-back wing and tail structures. These aircraft combined the latest German engineering data and processes with the fruits of the Soviet's own aerodynamic research, and with their tactical requirements. This phase produced the *La-16* (*Me-362*), *Yak-21* (*Me-263*), *La-17*, and *MiG-15*. The latter models were evolved from the Kurt Tank design for the *Ta-183* rather than—as has been generally reported—from the purely research aircraft *DFS-346*, or experimental fighter *P-1101*. This phase is, of course, still very much in progress.

4. *A long-range bomber build-up* which also is currently in progress. Production emphasis has been placed on the *Tu-71* (popularly called the *Tu-4*) to replace the older *Pe-8* wartime bombers which are still in the majority. Research and development efforts are reportedly being concentrated on the larger *TuG-75* "Soviet *B-36*."

Over-all research efforts appear, meanwhile, to have followed a comparatively steady curve which has not been influenced to such an extent by politico-military emphasis on first one type of weapon and then another. How this research activity has been departmentalized is shown in a general way by the diagram on page 85. The underlying factor which appears to have governed Soviet research efforts is that, with the exception of electronics, the Soviet scientists were able to make such marked progress because they already were far enough advanced to make immediate use of the loot they got from other nations.

In the bomber development, a promising Soviet prize appears to be the *Horten 18* flying wing. This plane was designed for a 4-ton bombload, a 15-ton fuel capacity which would afford a range of 3,500 miles, and a gross weight of 75,000 pounds. It was to be powered by four turbojets, with a design speed in excess of 500 miles an hour. The second bomber is a Messerschmitt project of undetermined designation which was slated for production early in 1946. This plane was to be powered by a combination of jet and piston engines, and was a later model than the widely discussed *Me-264* with which the Nazis hoped to bomb the United States. It is conceivable that the Soviet scientists are not developing any of these bombers; but if they are not, this represents a complete reversal of policy.

Top Technical Aid

Complete perusal of all these advanced German designs was facilitated by the success the MVD and *Smersh* had in rounding up some of the best technical talent in Germany. When Professor Bock, research chief of the German Air Ministry (RLM), was enticed to go to work for the Soviets, he made available not only the best data in the Ministry itself, but recruited most of the Peenemunde staff. To continue their study of the *Me-163* and *Me-263*—from which they later developed their *Yak-21* interceptor—the Soviets had the services of the ship's project engineer, Rudolph Rental. To aid in this study of swept wings, they had Dr. Adolph Betz of Gottingen, one of the top authorities on the subject. The complete facilities and skeleton crews of the DVL (Research Institute for Aeronautics) and Rechlin Experimental Station were shipped to the Soviet Union.

Famed designer Yakovlev was put in charge of the German scientists and technicians and was directly responsible for them to *Smersh*. For the most part, these experts are working at Kimry, north of Moscow, and at Ramenskoe (the Soviet Union's Wright Field, a few miles southeast of Moscow).

According to Lieutenant Colonel Grigori Tokaev, who headed one of the Soviet technical missions in Germany before he escaped to England in 1948, the Russo-German situation was something of a mess for many months. For the most part, the technical people were induced to work for such considerations as fancy apartments, cars, special rations, and liberal pay. Others, fearful and resentful, would not "give" freely of their information. Still others asked for no special inducements, seeing in their aid to the Soviet Union a possible revenge against America and Britain.

Recalcitrants were disciplined in typical *Smersh* fashion through threats of violence against the Germans' families or transfer to the Siberian slave labor camps. On the other hand, Tokaev revealed many sound criticisms of equipment made in good faith, but the captured experts were rejected, out of sheer stubbornness or misguided national pride in Soviet creations, by the Soviets as "sabotage." The result was an atmosphere of mutual suspicion. The great number of people involved—several hundred thousand—and the great amounts of data and material to be evaluated only combined to add further to the confusion. It is pointless to list here the various plants which are known to have been stripped of their facilities and personnel or reactivated on their sites in captured territory. The war spoils included every important airframe, engine, or component maker that contributed to the Reich's war effort. The United States and Great Britain got, for the most part, what was left or overlooked—which was considerable at that.

Guided Missiles

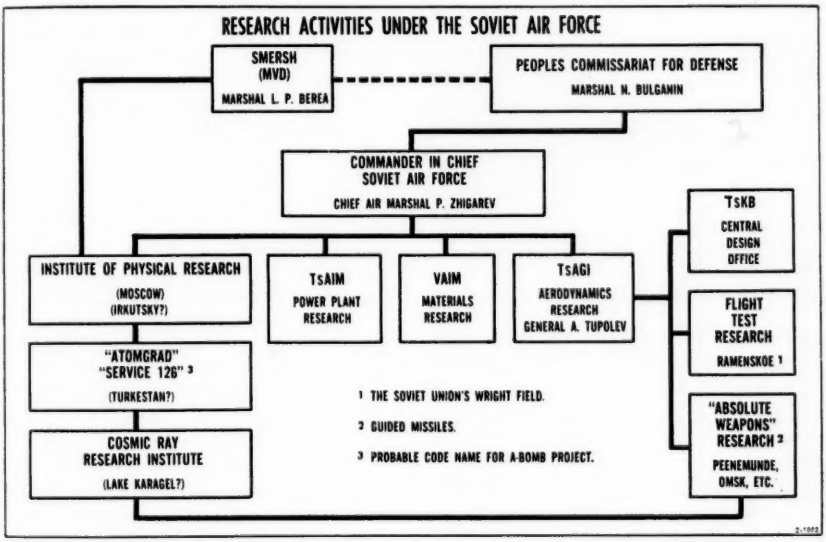
The same thing may be said of the *V*-weapon and guided missile maker, and in this field the Soviets are admittedly making headway. It will be recalled that as early as the summer of 1946, reports from Sweden and the Danish island of Bornholm cited scores of rocket firings from Peenemunde and other points along the Baltic. A German technical expert now in the United States surmised to the author of this article some time ago that he believed the Soviets "to be further advanced in liquid-fuel-rocket research than America," and that only our superiority in electronics made doubtful "that the same thing might not be said of the whole area of guided missiles."

It is well known that considerable equipment and plans for the entire gamut of *V*-weapons, ranging from the *V-1* robomb to the imaginative Sanger Project for a satellite vehicle, fell into Soviet hands; and considerable effort has been applied for the development of some of these "absolute weapons," as they are called in the USSR. The most sensational disclosure yet made in this direction came from our Central Intelligence Agency, whose agents reported recently the existence of a missile which could be launched with accuracy from submarines at a distance up to 140 miles. This would seem to verify that Soviet effort is bearing fruit in a manner that America can consider only as menacing.

Armament

Soviet ordnance has long been considered among the very best, and aircraft armament is no exception. This superior quality of guns has resulted in the past from a combination of good design, advanced metallurgical practices, and sound interior ballistics. Their acquisition of data, facilities, and personnel from Krupp,

Skoda, and Mauser should enable the Soviets to maintain these standards of ordnance quality. The fire control equipment—in the air and on the ground—has, on the other hand, not matched the excellence of the weapons. Although this still may be the case—as might be suggested by the poor marksmanship evidenced to date in Korea by the MiG pilots—the Soviets certainly must be striving to overcome this deficiency.



Gun Types

A wide variety of cannon armament is known to be in use on both fighters and bombers, and still other heavy caliber guns are being developed. Even the existent weapons provide the Soviet aircraft, to date at least, with heavier armament than is, as yet, being used on operational American or British planes.

The VY-a 37-mm gun is standard on both the *MiG-15* and *La-17* fighters. This cannon has an over-all length of 138 inches and weighs about 390 pounds. The magazine is reported to accommodate 40 rounds of ammunition. Reports from Korea indicate that this cannon has a comparatively low rate of fire and muzzle velocity.

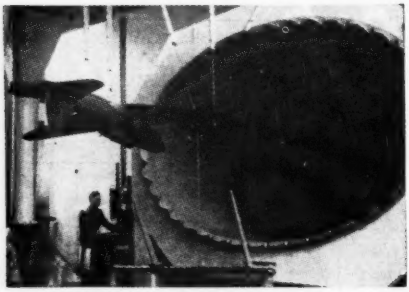
Also standard for fighters is the VY-a 23-mm cannon which is definitely a high-velocity weapon. This gun is 85 inches long and weighs approximately 150 pounds. Rate of fire is between 400 to 600 rounds a minute.

The widely used Sh-VAK 20-mm gun is considered more compact than the Oerlikon and has been compared with even the Mauser cannon. It is only 66 inches long and weighs 90 pounds. The cannon is belt fed and has a cyclic rate of about 950 rounds a minute.

The standard machine gun is the Beresin VKB 12.7-mm model, which is said to be better than the American M-2, but not as good as our now-standard M-3 gun. The VKB has a cyclic rate of fire of some 900 rounds a minute. A synchronized VBS model, not so widely used, fires at a somewhat slower rate.

The real Soviet threat in air-to-air

weapons lies in their version of the German Mauser 213/C 30-mm gun and developments of the *Luftwaffe's* R4/M rocket. The Mauser fired at a rate of 1,100 rounds a minute, and was considered the finest aerial gun of World War II. The Soviets also have experimented with the Rheinmetal MK108 30-mm gun. The Soviet model is said to have been in



A model being tested in a wind tunnel at one of the Soviet aircraft centers.

production for some time. It is known, also, that the Arms Trust is attempting to develop the larger German 214/A 50-mm gun and a 57-mm cannon of original Soviet design in their bid to maintain fire superiority in the air. The R4/M is a 7.75-pound rocket which has a speed of Mach 2.0. It carries a 1.1 pound warhead. Air-to-air rockets were used experimentally on a few of the first *MiG-15s*, with rather general agreement among sources that the most popular size was a 40-mm rocket. Further developments along these lines logically can be expected in view of the long-standing Soviet interest in airborne rockets.

Decisive fire effect, however, cannot be ensured solely by the fact that Soviet fighters carry heavier armament than do ours at the moment. Fire superiority is equally dependent upon efficient gun sights and gunnery skill in using both the weapons and sights. No reliable information is available concerning the types of gun sights used on operational Soviet aircraft. Some tests were known to have been made on earlier *MiG-9s* with the excellent German REVI-17 optical sight, and it is possible that these are in use today. More recent information persists that the search radar used in the *La-17* also is capable of aiming function; but we believe that this equipment must be limited to range-only indications and is not yet capable of the range-rate computations American experts consider essential in a true "radar gun sight."

Electronics

The lack of modern electronics equipment was one of the greatest limitations under which the wartime Soviet Air Force was forced to operate. It is not generally known, even today, that the Soviets were making good progress in a sizable radar and radio laboratory in Leningrad late in 1941. Then a singular stroke of bad luck occurred when a stick of *Luftwaffe* bombs wiped out, at one fell swoop, nearly all of the top-ranking electronics experts and their equipment. This was a blow from which the Soviets never recovered.

At different periods during the war, they obtained a number of "samples" of various kinds of radar. From the United States, the Soviets got, as lend-lease equipment in aircraft, 370 search and navigational airborne radars. They were given 170 radars for ground installations, including about 60 IFF equipments. England sent to the USSR about 1,800 ground and marine radars.

The Soviets got *Morgenstern* AI (airborne intercept) gear from downed *Ju-88* night fighters, and *Wurzburg* search and fire control equipments from territory overrun in Eastern Europe. The Communist spy rings in Canada, the United States, and Britain sent to them detailed information on still other radar gear. However, the Soviets were for some reason unable to capitalize on this haul until they received direct German aid. Technicians and facilities from Tele-

funken and Siemens Askania were shipped, along with hundreds of dismantled radars, to the USSR.

Later on, a systematic round-up was made of workers in the Balkans, Austria, and Germany who had any experience with electronics equipment of any type. Cadres of the best "recruits" were formed for the instruction of Soviet workers.

Information of recent date has it that the Leningrad facility has been rebuilt and enlarged, and that radar, radio, and other equipment is being manufactured at Moscow, Riga, Kiev, Voronezh, and a number of localities in Central Siberia and the Far East. Soviet progress must be marked indeed to effect an airborne-intercept installation such as highly reliable sources report in the *La-17* fighter and compact search gear which is apparent in photos of the *Tu-10* bomber.

Radar Net Operating

The Soviet network already is operating in sections of the West and Far East, with reports of as many as 3,000 installations of *Wurzburg* or *Wurzburg*-type radars. The smallest mobile equipment for control purposes is said to be mounted on two trucks. There are direct indications that a considerable number of people must be in training for the operation and maintenance of this equipment. Moreover, serious attention is being given to radio countermeasures. The Soviets have, for instance, set up between 300 and 400 strategically located jamming stations to throttle effectively (within the USSR proper, at least) our powerful and cleverly monitored Voice of America broadcasts. The very manner in which the Soviet operators detect and promptly jam our frequency shifts is indicative of sound countermeasures training. The wartime implications of this are self-evident.

VHF Widely Used

Considering the amount of communications equipment which the Soviets inherited through lend-lease, their shift to very high frequency (VHF) in both civil and military operations appears to have been made tardily. It is known, however, that they are now producing in large quantity a domestic version of our Bendix command set. In the radio field another of the characteristic Soviet paradoxes is seen in their use of the obsolete mast antenna on their best operational fighter, the *MiG-15*, while the slightly older *La-17* (not as yet committed to battle at this writing) is reported on excellent authority to be fitted with recessed and stub antennas for VHF reception and transmission, respectively.

United Nations Lead

Since the Soviets do not believe in the free enterprise system that makes possible here such superb research and manufacturing organizations as General Electric, RCA, Westinghouse, or Western Electric, our superiority in the whole electronics area should be assured. This includes the equipment required for atomic research and production, guided missiles, proximity fuzes, communications, countermeasures, miscellaneous devices and instruments for "systems engineering," plus scores of other apparatus and techniques outside the province of aviation. Perhaps in no other single area should United States superiority over the USSR be so clearly defined as

Students studying principles of aerodynamics "somewhere in the Soviet Union."

in the field of electronics. However, this is a lead which will have to be maintained: the amount of effort being expended in Soviet laboratories leaves little room for complacency. Their advance has been proportionately faster than America's. Our electronics legacy resulted directly from our wartime techniques and facilities. The Soviets had no wartime industry at all. Their progress has been made since the war, and mostly within the past 3 years.

Balanced Forces for the West

Digested by the MILITARY REVIEW from an article by Major W. G. F. Jackson in the "Journal of the Royal United Service Institution" (Great Britain) May 1951.

This is the second of a series of two articles on this subject. The first article of this series appeared in the December 1951 issue.—The Editor.

AS POINTED out in the first article of this series, the policy of collective balance, however desirable in theory, always must be limited in scope by the following factors:

1. Each country must be allowed to retain the forces it needs to defend its vital interests and to meet its moral obligations.

2. The vulnerability of countries to internal disruption or forcible conversion to communism must be taken into account.

3. The command organization must be capable of quick and effective decision.

4. Dependence on long sea communications during the defensive phase must be kept to a minimum.

Application

Let us now apply these principles to the defense forces of the United Kingdom to see whether they would be practical and how they would affect the shape of our forces.

Defining 'Vital Interests'

First, we must be clear about our vital interests. These can best be summed up in our three traditional pillars of strategy: "The defense of the United Kingdom, the defense of the Middle East, and the defense of our sea communications." The defense of the United Kingdom can no longer be entrusted only to sea and air power. The advent of the long-range rocket and high-speed aircraft makes the land defense of Western Europe vital to the defense of the United Kingdom. We must, therefore, recast the first pillar of our strategy to read "the defense of Western Europe."

The defense of our sea communications still is our vital concern, but, in the face of the tremendous odds against us, should we continue to place the defense of the Middle East on a par with that of Western Europe? If Western Europe were overrun, we would be faced with the possibility of immediate defeat; but if we were to lose the Middle East we would be faced only with defeat in the long run unless we could regain our position there. The defense of Western Europe, therefore, should come before the defense of the Middle East, though the Middle East remains vital to us in the long run. If we can find someone else to help us in the Middle East, we should do so in order to concentrate more of our strength in defense of Western Europe and our sea lanes.

Accepting Collective Balance

The second thing to decide is with whom we should accept collective balance. There is no problem in the outer ring, but the inner ring presents some difficulty. As we have territories in the three suggested collective security zones, we must consider them all. In the North Atlantic area, we should, in theory, be prepared to assist the countries bordering the Iron Curtain, but we should not depend upon them for collective balance because they are in danger of forcible conversion. However, Western Europe is vital to us, and, since we cannot defend it without the assistance of the Western European powers, we cannot accept this theoretical reservation. We must take the risk of accepting collective balance with Western Europe. At present, the risk involved in doing this is great, but we can reduce the risk by wholehearted economic and military support of the Western Union. As the Western European countries become stronger, the chances of forcible conversion and internal disruption will lessen. However, Western Europe will never gain strength if we consider ourselves in a special "intermediate ring" or part of the outer ring.

In the Middle East zone, the problem is to find someone else to shoulder some of the load. South Africa, Pakistan, and India would be the main support areas, but can they supply the necessary strength? At present, the answer is "no," but we should do all that we can to build up their strength. Much as we would like to hand over the responsibility for desert warfare to these countries, we cannot do so at the present.

In the Far East, a similar position exists. Australia, New Zealand, India, and the United States are main support areas. The United States may be heavily committed in the Pacific. Can Australia, New Zealand, and India look after Southeast Asia? The answer is again "no—not at present." Our aim must be to strengthen them to undertake some of these responsibilities eventually. In the meantime, we cannot give up forces trained and equipped for jungle warfare.

With these factors in mind, let us now consider each armed service in turn to see what outside assistance we can expect, and what assistance we must give to others.

Navy

The Navy is best considered in five components:

1. The strength element consisting of the heavy ships, battleships, carriers, and cruisers.
2. The numbers element containing destroyers, escort vessels, and small craft of all types.
3. The merchant navy.
4. Base installations.
5. Landing craft.

The strength element takes many years to build up and cannot be dispensed with lightly. On the other hand, the Soviet Navy possesses very few heavy ships. Most of our naval strength will be required for the battle against the submarine. Though we still will need our heavy ships in case of the forcible conversion of some Western European fleets and for defense of our convoys against surface raiders, the outer ring is better placed to provide the bulk of the strength element. We might, therefore, give the construction and manning of heavy ships a low priority and depend on the outer ring to neutralize the Soviet heavy ships.

As far as the numbers element and the merchant navy are concerned, every Western power must build as many antisubmarine craft and fast cargo ships as they can man. There will be no question of collective balance; collective effort using every craft available will be needed.

Bases present a different problem. We already rely on our allies and the Commonwealth to provide bases. Can we close

any down? Is Malta necessary if collective balance gives us the use of Italian ports? In this case, the rule of not accepting balance with countries too near the Iron Curtain holds good because the defense of Italy is not vital to us to the same degree as Western Europe. We would be unwise to close Malta and depend on Italian ports in the Central Mediterranean. The West Indies bases, on the other hand, might well be closed as we can rely firmly on the United States.

Finally, landing craft, though useful in most operations, are essentially offensive phase craft. We cannot consider large-scale assault landings early in a war. The bulk of these craft might be better provided by the outer ring when the time comes.

Army

If we accept that we are an inner ring country and, therefore, responsible with the rest of the inner ring for stemming the initial land and air assault, then there are three ways in which we can concentrate the strength of our land forces on this task, namely:

1. By giving up all units and equipment needed for major offensive operations.

2. By relying on the outer ring to provide troops for certain specialized operations.

3. By stock-piling, before war starts, equipment produced in the outer ring which is needed in comparatively small quantities or has a small wastage rate.

The difference between offensive and defensive operations of land forces is one of quantity. The same units and equipment take part in both, but on a reduced scale in defensive operations. There are few major items belonging to the infantry, artillery, or armor which are not needed in the initial defensive battle. On the engineer and administrative sides, however, there is a great difference between defensive and offensive requirements. The resources needed for an offensive over devastated country involving the construction of airfields, roads, railways, harbors, and so forth are not required during the defensive phase. The larger repair organizations, equipment depots, and transport echelons needed to sustain such an offensive are required only on a reduced scale. We might, therefore, depend on the outer ring for a large proportion of our engineer construction resources and for the build-up of the administrative tail. Provided there has been a reasonable degree of standardization of equipment, this should be possible.

The specialized operations which we might forego are:

1. Large-scale amphibious operations.
2. Large-scale airborne operations.
3. Arctic operations.
4. Mountain operations.

The first two will be needed only in the offensive phase and could be the responsibility of the outer ring. Arctic operations could be entrusted to Canada and the Scandinavian countries. Mountain operations could be handed safely to the French, the Scandinavians, and the Italians. Desert and jungle training, and research and development, however, must be retained until we can hand over this commitment to whomever covers the Middle East and Southeast Asia.

Stock-piling of equipment from the outer ring might cover such slow moving items as heavy artillery, heavy engineer equipment, electrical machinery, and some types of radar. They should be items used in small numbers which could be replaced even if shipping is tight.

Air Forces

Air forces probably provide the greatest scope for collective balance. The aircraft themselves are not hampered by sea communications, though the movement of their supplies and maintenance

organization still depends largely on shipping. Aircraft can be manufactured safely in the outer ring and flown anywhere they are required. As we will be faced with a large enemy air force, we must use all the aircraft production potential which the free world possesses. Collective balance will allow us to use these resources to their best advantage.

Establishing Air Superiority

Experience has taught us that the first task of an air force is to establish air superiority. We have also learned that a balanced air force is needed to achieve this aim. Today, we are faced with the possibility of Europe being overrun before the strategic bombing of Soviet industry and communications can take effect. The recent events in Korea have underlined this danger. In Korea, there was no enemy air opposition after the first few weeks, but, if the Soviet Army attacks in the West, it will be supported by large tactical air forces. If the inner ring countries are to carry out their task of stemming the initial Soviet assault, they must place first things first and concentrate on destroying these tactical air forces. As they will be working against time, they must use the most direct means. However desirable balanced air forces may be, the inner ring must concentrate on fighters and light bombers, leaving the indirect attack with strategic bombers to the outer ring.

Fighter Defenses

In our own Air Force, the fighter defenses of the United Kingdom must be given first priority. They form part of the forces which we must be allowed to retain in our own hands to defend our vital interests. As an inner ring country, we should concentrate the rest of our air resources on the tactical land and air battle, but this would mean sacrificing our great experience in strategic bombing and our ability to produce long-range bombers. Like the strength element of the Navy, our bomber forces have taken a long time to create and should not be dispensed with lightly. Though we may have to place strategic bombing on a low priority, we should not dispense with it altogether, as it will play a vital part in the build-up and offensive phases.

Concentration by the United Kingdom on fighters and medium-range bombers would fit in well with the principle of the best man for the job. Our lead in jet design, and the American lead in the production of long-range aircraft, provide a good example of the advantages of collective balance. Since a major allied land offensive is unlikely for some time, we also should leave the production of transport aircraft to the outer ring.

Summary

As far as the United Kingdom is concerned, accepting the degree of collective balance envisaged would mean we could concentrate on:

1. Winning the early land and tactical air battles without allies in Western Europe.

2. Keeping the sea lanes open for the build-up and offensive phases of a war.

To do this, the Royal Navy, together with the Coastal Command, would concentrate on antisubmarine warfare, and our shipbuilding yards would concentrate on antisubmarine craft and fast merchant ship construction. The Army would be organized primarily for continental warfare in Western Europe. The Royal Air Force would look to the fighter defenses of the United Kingdom and the tactical land and air battle in Western Europe.

We might relegate the construction and manning of heavy ships, strategic bombing, Arctic and mountain warfare, and, eventually, jungle and desert warfare to a low priority. We would depend on the outer ring for:

1. The neutralizing of enemy heavy ships.

2. Strategic bombing in the defensive phase of a war.

3. Quantity production of latest types of equipment for the offensive phase of a war.

4. Transport aircraft for large-scale airborne operations.

5. Landing craft for large-scale amphibious operations.

6. The build-up of engineer and administrative resources for the offensive phase.

In all probability, most of these economies would have been necessary whether we accepted collective balance or not. However, in accepting this policy, we ensure that the outer ring prepares to cover our deficiencies. In return for this assistance, we will have to abandon once and for all any idea of not taking part in the first land and air battles in Western Europe. We also must provide a base for the forces of the outer ring operating in the European theater.

Conclusion

The case for collective balance turns on three factors. If we in the free world are to win the cold war, we must discredit communism by raising the standard of living of our people. We can do this only if defense expenditure is kept to a minimum. Collective balance will help us to achieve this economy. If we are to win a shooting war, we must ensure that we are materially and morally superior to the Soviet Union and her satellites. We have far greater material resources than the Soviet Union, but they are not organized effectively. Collective balance will help to integrate these resources. However, material strength alone will be useless unless the inner ring has the will to win. Collective balance will help to give the inner ring the confidence it needs, and will help to ensure that the countries bordering the Iron Curtain do not decide that communism is better than destruction.

The degree to which we can accept collective balance depends on restrictions imposed by the lessons of history and our doubts about the reliability of alliance in long-term planning; by the need for the infringement of sovereignty; by the submarine and air menace to our sea communications; and, finally, by the difficulty in controlling effectively so many individual governments.

If we apply collective balance to the forces of the United Kingdom, bearing these restrictions in mind, we find that we lose little and gain much. We should, therefore, accept wholeheartedly the policy of collective balance provided:

1. We are allowed to retain the forces which we consider necessary to defend our vital interests and to meet our moral obligations.

2. Account is taken of the vulnerability of the countries with whom we are to accept collective balance—either by forcible conversion to communism or by internal Communist disruption.

3. Account is taken of the vulnerability of our sea communications and we are allowed to retain a degree of national balance during the defensive phase.

4. Any organization set up is kept within manageable proportions by restricting collective balance to groups of countries with common interests.

Who Is Responsible for the Defense of Airfields And Air Force Installations?

Digested by the MILITARY REVIEW from an article by
Squadron Leader H. S. Bakshi in the "Indian Air Force Quarterly" (India) July 1951.

THE defense of airfields and air force installations is an air force problem which no air staff can afford to neglect, irrespective of whether it be considered an army or an air force responsibility. The security of airfields from enemy ground attacks pays heavy dividends toward the efficiency of air forces in the air. In operations, no air commander would think of moving aircraft to new airfields unless ground defense arrangements are completed in the area.

Success Depended on Airfields

World War II has been aptly described as a war for airfields; that is, the success of most operations depended on the success of capturing enemy airfields or defending our own. During the war, airfields and air force installations in the Far East were heavily attacked by the Japanese with the main purpose of gaining air superiority in the quickest possible time. In Malaya, the army was unable to provide secure air bases for the air forces, with the result the air forces were unable to provide the army with adequate air support. The consequences were retreat and heavy casualties. The fall of France and the loss of Crete provide the same story.

Airfields Need Protection

These examples show that air superiority, which is so essential for the conduct of modern warfare, cannot be gained in the absence of airfields secure from the enemy. Moreover, this security cannot be ensured merely by locating the airfields well behind the battle zone. Airfields and other air force installations may be a liability rather than an asset unless there are sufficient forces available to prevent the enemy from capturing and using them.

Therefore, problems in connection with the defense of airfields and air force installations are matters which must be given serious consideration.

The Question of Responsibility

While it is apparent that the general protection of airfields and air force installations should, of necessity, be the responsibility of the army commander within whose defensive area a particular airfield or air force installation is located, and that the responsibility for security of the air force installation against theft and sabotage is the immediate and ultimate responsibility of the air force installation commander, there seems to exist some difference of opinion as to the responsibility for the local protection of such fields and installations. This particular question cropped up in the Royal Air Force during the last war, but it appears that it has not been settled completely. Up to the end of 1940, there still was indecision as to whether the War Office or the Air Ministry should ultimately bear the responsibility of defending Royal Air Force stations. However, the formation of the Royal Air Force Regiment took away from the British Army the responsibility for the local protection of RAF installations. However, the RAF took on the responsibility for the local defense of its airfields and auxiliary units in the European theater, but allowed the Army to retain this responsibility in both general and local protection in Southeast Asia. The fact that during a particular phase of the World War II operations in Burma RAF planes had to fly into an area at dawn and leave at nightfall, because of the Army's inability to provide personnel for duty at airfields, shows that this latter arrange-

ment of depending upon the Army for local protection of airfields did not work out satisfactorily. This problem, therefore, needs consideration in detail, keeping in mind the experiences gained during World War II.

Instruments of Local Protection

Instruments for the local protection of airfields and air force installations can be any one of the following, or a combination thereof:

1. Army personnel.
2. Air force station personnel.
3. Specially trained personnel of the air force (such as the RAF Regiment).

It would be advantageous to study in detail the tactical, administrative, and other considerations in the employment of the categories listed above as they would pertain to providing local protection for airfields and air force installations against:

1. Enemy ground attacks.
2. Enemy air attacks.
3. Attacks by enemy air-landed forces.

Army Protection

The local army commander may decide to discharge his responsibility for the local protection of air force installations by either ensuring that his general defensive plan includes the air force installations or by allocating definite troops for the protection of such installations.

While the former arrangement should suffice if the air force installations are located well behind the battle zone, and the latter arrangement resorted to only in case the air force installations are near the front lines, the experiences of the last war proved that such arrangements do not work out satisfactorily. Many times, units of the RAF Regiment had to be rushed to airfields to take over their defense when the army was unable to provide troops for that purpose.

Even if troops are allocated by the army for the defense of forward airfields, there is no guarantee that such troops will not be withdrawn in the event that the land battle becomes critical. In fact, this is what happened quite often in the last war, and it can happen again under similar circumstances.

Dependence on Army Defense Plan

Is the allocation of troops for the close defense of forward airfields absolutely essential? Cannot the air force depend upon the general defense plan of the army? A study of operations in Burma would be most instructive in arriving at the answers for these questions.

There, the urgency of providing close tactical air support to army formations in the field entailed the location of airstrips and air force units in close proximity to the battle line. The terrain was such that the maintenance of an unbroken screen by the army was impossible, and the major threat was infiltration by small enemy forces. The only effective countermeasure was the location of defense forces at the airfield or installation to be protected.

In addition, airstrips were established frequently on the heels of the advancing army troops, who, in most instances, were unable to leave defense forces behind during their continued forward movement. This problem was complicated further by the fact that it was not unusual for pockets of the enemy to be left behind in this area. Under such circumstances, the only solution was to have RAF Regiment units ready to take over the defense of airfields and other installations used by the RAF as soon as they were taken from the enemy.

Apart from the above, in modern, mobile warfare, defense plans are subject to continuous changes, and it often becomes impossible or impractical to include the defense of airfields and air force installations in the army defense plan.

The foregoing considerations all point out the impossibility of depending solely on the general defensive plans of the army

to include the local protection of advance airfields and air force installations.

Provision of Close Defense

The provision of close defense for airstrips and air force units by the army normally would entail locating troops in the vicinity of such installations or units to protect them against attacks by enemy ground or air-landed forces. This also would require the siting of antiaircraft artillery for protection against enemy air attacks.

An ideal tactical formation for the defense of airfields is one which allows for maximum mobility. Against air-landed forces, the instruments of mobility should be such that their vulnerability to air attacks is negligible. For example, vehicles and armored cars are normal instruments of mobility in an army. They have speed and are ideal for large movements, but they are vulnerable to air attacks. Bicycles, on the other hand, are slower and efficient only for short tactical movements, but they are not as vulnerable to air attacks. In the defense of an airfield, the characteristics of the bicycle make it a good instrument of mobility. Bicycle formations are flexible, capable of movement with comparative ease (the movements of defense forces at an airfield would be for short distances), and the maintenance of equipment is less costly.

The considerations mentioned above point out the facts that in case the army commander elects to allocate definite troops for the local defense of airfields, he should, before deciding on the structure, composition, and establishment of the formation, study the special requirements of meeting the threefold threat to the airfield, and not merely detail any formation requiring a little respite from active combat.

In addition, if army forces are allocated for airfield defense, they should be under the sole control of the air force commander, and not be subjected to control by both the army and air force commanders.

Air Force Station Personnel

The use of air force station personnel in a ground defense role is both uneconomical and impractical. To divert them from their primary duties for the purpose of ground defense over a sustained period of time is most injurious to their primary role—the achieving and maintenance of air superiority. The constant employment of air force personnel in defense duties induces fatigue and reduces their efficiency in maintaining the serviceability of their aircraft. Under such conditions, tactical support for the army cannot be maintained at its full potential.

Apart from the above, the strength and organization of the units at an airfield are based on the workload and duties they must perform; not on the size of the airfield. Therefore, the strength of the maintenance units at an airfield may not be sufficient to take care of the protection required.

This, however, does not rule out the employment of station personnel in augmenting ground defense forces to the limit of their resources in an emergency. In fact, in wartime, it is necessary to utilize everyone available to the best possible advantage. No member of the air force is too valuable to fight when circumstances make it necessary that he should do so.

Indian Air Force Regiments?

The considerations mentioned above point out the fact that an air force should depend on its own resources for ensuring protection to its airfields and installations; and for this purpose it should organize a special formation within its own fold.

In its infancy, such a formation can be best organized by using already trained personnel of the army.

However, there are financial considerations that must be met. All the finances

available for a growing air force (such as our own) should be used for strengthening it in its primary role. Unless an air force is fully developed for discharging its primary role, the formation of ground defense units is premature.

As the formation of reserve units is considerably cheaper than the formation of regular units, it might be practicable, even for a young air force, to establish ground defense units at strategical airfields or towns on a reserve basis.

The formation of reserve units prior to the formation of regular units may seem like putting the cart before the horse, but such a step would be a definite advantage as long as a nucleus training staff is embodied within the regular force.

Meteorology as a Servant of Strategy

Translated and digested by the MILITARY REVIEW from an article by Emile Lardinois in "L'Armee la Nation" (Belgium) 1 August 1951.

WEATHER always has been a major factor contributing to the success or failure of battles. History provides us with many examples of military operations being lost because the weather was against one of the opponents.

For example, in the Battle of Waterloo, weather played perhaps a leading role in the destiny of the French Army. Around 1400 on 17 June 1815, a heavy storm spread over most of Central Belgium. Within a short time, the future battlefield of Waterloo, and all the surrounding areas, were turned into a veritable marshland; practically impassable to both men and horses. The French troops were forced to rally on the highway from Quatre Bras to Brussels. Soon the highway became congested, and the regiments of all arms marched on it in a state of confusion. Thus, the weather played an important role in slowing the march of the French Army and the execution of Napoleon's plans. (The British troops, on the other hand, suffered less from the storm, for they already were in position when it began.)

Modern Warfare Requires Accurate Meteorological Data

In modern warfare, the movements of armies are carried out over great distances, on land, in the air, and on the sea. Meteorological factors can have a great influence on such movements. To foresee such meteorological influence, and to determine whether such influence will have an advantageous or disadvantageous effect on military operations, are jobs which the meteorological services perform in wartime.

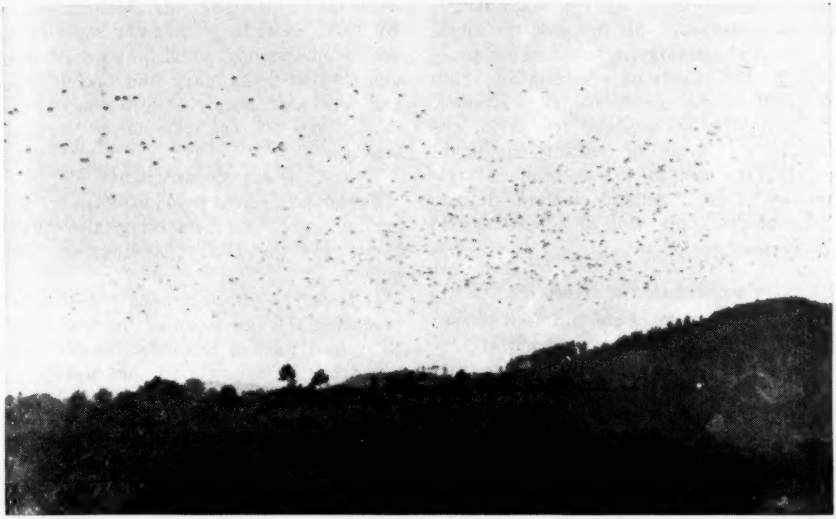
During the last war, the logical and careful exploitation of weather factors often made up for technical disadvantages. In general terms, meteorological information required in planning military operations can be divided into two categories, namely:

1. Forecasts of weather for operations which are to be conducted in the near future.

2. Special studies of weather relative to the preparation of a strategic plan.

In short, what commanders and their staffs demand of meteorologists is information which may be summarized in the question "What influence will the weather have on the proposed military operation?"

The old system of providing general information relative to the atmospheric conditions characterizing a particular region was found inadequate for planning military operations. Therefore, during the early part of World War II, a new field of



Meteorology played an important role in the planning for the Normandy invasion, for the military planners had to know during what period weather conditions would favor air and sea-borne operations. Above, paratroopers jumping near La Motte, France, on D-day. Below, assault troops landing on a beachhead on D-day.—Department of Defense photos.

meteorology—called "applied climatology"—was developed. This included the application of climatology in solving such problems as the effects of precipitation—rain or melting snow—on the height of streams, the influence of weather on crops, the amount and types of heating equipment required to combat winter temperatures, as well as other related matters. It also included the application of climatology to the forecasting of weather.

Co-ordination a Necessity

The development of the different phases of a military plan demands complete co-ordination between the ground, air, and naval forces. The same is true with respect to the weather reports furnished by the meteorological sources working for all of the staffs. It is not enough to know in what manner weather will influence each phase or part of an operation, it is necessary to know the influence of weather on the entire operation.

The large-scale operations carried out by the allies in North Africa, Sicily, Italy, and France showed that a detailed analysis of the effects of the weather on the development of the operations was essential in planning the attacks.

Planning for D-day

Atmospheric conditions weigh heavily on the choice of the time and place of a projected operation. Weather conditions favorable to the transporting of troops and equipment by air and sea must correspond with the projected D-day. In addition, other meteorological factors such as the height of tides, visibility, and duration of particular weather conditions must be known.

The landing in Normandy required an enormous amount of planning, and meteorology played an important role in that planning.

A detailed study of the climatology of the English Channel was begun late in 1942, and, in 1943, a similar project was undertaken covering the French coasts. By 1944, eight large volumes represented the complete study, which was worked over again between January and March 1944, and concluded, finally, with a study of the climatology of the Normandy invasion beaches.

D-day Requirements

From the general point of view, the following were the meteorological requirements for the D-day landings in Normandy:

1. D-day should be around the fifth day preceding the full moon or the new moon. (The first part of this requirement being based on the assumption that paratroopers would land by moonlight.)
2. Visibility should be at least 3 miles.
3. Cloud cover should not exceed three-tenths of the total area of the sky, and the clouds should be at 8,000 feet.
4. Wind should be relatively calm.
5. During the period from D-day to D plus 3, the wind should not change direction nor increase.

Subject to the factors above, the decision to invade the Normandy coast was made by the allies early in 1944. The landings were to take place within 2 or 3 days of 1 June 1944 (the latest date being designated as Y-day). A modification of the favorable period was effected on 27 April 1944 by the General Staff, which put D-day within 4 or 5 days of Y-day (thus setting D-day within the period of 17-22 June 1944). From April until early June, the major question at all strategic discussions was the future weather conditions. Finally, the die was cast, and D-day was fixed at 6 June 1944; H-hour at 0640.

The weather on D-day was not "ideal," but it was "acceptable."

It is possible that the meteorological studies contributed greatly in tipping the balance in favor of the allies, for if the operation had been postponed until the period 17-22 June, the worst weather imaginable would have been encountered.

German Data Were Inaccurate

On the German side, the meteorological data were inaccurate. The chief meteorologist of the German General Staff had informed his superiors that an allied invasion after 4 June 1944 was impossible, because of the bad weather prevailing over the Atlantic. Therefore, the Germans were caught by surprise at the beginning of the landings. As a matter of fact, many of the officers of the German divisions in the invasion area were on leave on D-day.

The War of Movement

Modern warfare involves the rapid movements of enormous quantities of matériel over all types of terrain. Meteorology, through the interpretation of climatic factors, can assist a great deal in predicting the influence of weather on the movements of tanks and vehicles. However, it cannot provide all the necessary answers, and, here, pedology—the science of the soil—is put to work.

The pedologists, by their study of terrain, are able to predict the trafficability of the soil in the area where an operation will be conducted. Thus, meteorological and pedological data can be co-ordinated to provide the military commander and his staff with a wealth of information.

What About the Future?

What can be expected of the future concerning the influence of meteorology on the conduct of war? For one thing, equipment will be perfected to a higher degree, and weather forecasts will be more accurate. Already, great strides have been made, and there is every indication that meteorology will keep pace with the other technical advances of modern warfare.

Combat in Large Cities

Translated and digested by the MILITARY REVIEW from an article by General Niessel in "Revue de Defense Nationale" (France) April 1951.

COMBAT in cities has always been regarded as one of the most difficult types of warfare. Moreover, the development of artillery and modern weapons has not altered the situation.

Examples From the Soviet Front

Cities have been used throughout history as supporting points on the fields of battle—with the Soviet front providing some of the more recent examples of battles in large cities. Odessa, Sevastopol, and Stalingrad were bitterly defended by the Soviets, and, later, they themselves took Budapest, Bresslau, Königsberg, and Berlin in violent fighting. When encircled and bypassed, large cities interfere with lines of communications, and reduce fighting strength, because large numbers of troops must be held around such cities to hold them in check.

Many Difficulties Encountered

Fighting in cities is a long and difficult operation. It is impossible for artillery and air bombardment to prepare the attack completely. This type of fighting, with the many obstacles and narrow streets, breaks up the action into numerous local battles and requires a great amount of detailed preparation. In the houses, the fighting requires courage, cool headedness, and quick thinking, for most of the action consists of hand-to-hand combat, and it is a matter of killing or being killed. In most situations, the defenders have a well-developed network of underground passages, shelters, and command posts. For example,

at Odessa, the defenders had such a system of underground passages, and they continued their resistance until all of the exits had been sealed.

It is true that when fighting in cities, commanders and their staffs exercise overall control of their units, but success cannot be attained except by delegating authority down to the lowest ranks and by initiative on the part of all combatants.

Co-ordinated Action Required

The infantry has the predominating role in such actions, but it must have the continuous support of all the other arms, which requires co-ordination of all effort. The important thing is that the enemy must be pressed continuously so that he does not have the opportunity to re-establish his positions.

Many articles have been published in the Soviet Union relative to fighting in cities. Some of the outstanding works have been written by Colonel Generals Chuikov (The Battle of Stalingrad), Galitsky (The Battle of Königsberg), Berzarine, Kazakov, Malinine, and Vedeneiv (The Battle of Berlin). In addition, there have been many books written based on personal experiences during combat in cities. This article is based on material taken from all of these publications.

Preparing for the Attack

The preparations for the attack on Berlin began 2 months prior to the actual operation. The preparations for the attack on Königsberg began several weeks prior to the operation.

Thorough Staff Work a Prerequisite

As regards the staffs, the preparations consisted, mainly, of gathering and studying all types of information—aerial photographs, interrogation of prisoners of war, intelligence data, and information from former residents of the cities to be attacked. In addition, the plans for the operations were subject to continuous changes up to the last moment.

Since each division was to have several permanent observation posts, officers from all the arms were trained as observers. Such personnel were trained in compiling information quickly and transmitting it to those in charge of the operations, and to neighboring units.

Preparation of the Assault Groups

Careful attention was given to the organization and preparation of the assault groups; first with the separate elements, and then as a combined force. The staffs studied the organization and training of the assault groups in light of definite problems to be solved or objectives to be reached. All arms were prepared to engage in hand-to-hand combat; infantry, artillery, and engineers alike. Instruction covered the employment of weapons and explosives, cover and concealment, the crossing of obstacles, and hand-to-hand combat in houses. This training was given in specially arranged training grounds, and in occupied areas. In addition, it included exercises for officers and enlisted personnel on a sand table or on a large-scale map of the area where the operations were to be conducted.

The artillery, tank, and air force personnel participated in exercises with actual fire, as well as in combined exercises with the assault groups. Signal personnel were trained under conditions expected during the actual operation.

Defensive Operations in Cities

The defense of Stalingrad was a remarkable achievement, because the city is strung out along the Volga for a distance of some 13 miles, and has very little depth. During the operation, the Soviet Sixty-second Army held a front of 15½ miles, with a depth of from 220 to 2,750 yards. The command posts of the divisions were 220 to 330 yards from the front; those of the army 880 yards. The Germans reached

the outskirts of the city in August 1942, but the defenders were able to hold out until February 1943. The defenders took advantage of every opportunity for resuming offensive action, and small-scale operations frequently were able to regain lost strong points. Powerful artillery, under centralized control, provided support for the defense as well as taking enemy targets under fire.

Defensive Concepts

Colonel General Chuikov, in his works on combat in cities, advocates:

1. The creation of security positions 1,100 to 2,200 yards in front of the forward defense positions.
2. The creation of the forward defense positions among the buildings at the edge of the city, complemented by bunkers, trenches, and barricades.
3. The creation of successive positions, in the interior of the city, behind such obstacles as water courses, parks, squares, and broad avenues.
4. The creation of a redoubt, in the center of the city, or in a section of the city which offers the best chance for holding out the longest.

Colonel General Berzarine states that at Berlin the Germans had organized nine sectors, one of which was a central sector, in conformity with the redoubt concept, and that the strength of each sector was approximately 20,000 men.

Organization of Defense Positions

The defense positions are organized according to the concept of numerous centers of resistance, joined together by communication trenches, and having interlocking fields of fire. Such an organization makes it possible to maintain a continuous front, even in the event that the enemy attacks, and facilitates counteroffensive action. Demolition work which is necessary for preparing the defense positions is completed in advance, and others are planned and prepared for the future. In the defense positions, the buildings permit the organizing of fire support from many stories, the enfilading of approach routes, and the establishment of alternate positions. Some artillery weapons can be fired from the ground floors, and rockets can be used from all floors. The main effort is made to place fire on all streets which could serve as attack axes.

Slowing the Enemy Advance

The antitank defense is organized in depth, and makes use of artillery, short-range weapons, grenades, incendiary weapons, and mines, in order to hinder all mass attacks and prevent the rapid advance of the enemy tank forces. In addition, the antitank defense prepares walls which can be collapsed on the enemy forces, and maintains a mobile reserve of tanks to be used when needed.

Each center of resistance—generally under battalion or company control—is given its special defense plan, which outlines its mission, fire plan, the missions of neighboring units and the artillery, and the measures to be taken if the enemy penetrates into one of the neighboring centers of resistance.

The Germans, at times, employed tanks as fixed fire points, by burying them or by firing them from behind shelters. In general, tanks and self-propelled guns provide enfilading fire on the approach routes, or are used as mobile strong points or for counterattacks.

Offensive Operations in Cities

The Soviet plan for the Battle of Berlin called for the encirclement of the city and the splitting up of its interior defense in order to disorganize command and limit the possibilities of maneuver. Before attacking the city, it was necessary to penetrate the successive field positions which extended as far as 44 miles from the city proper. This action required the employment of two Soviet army groups.

Each Soviet division engaged in the

battle for the city was divided into two echelons and assigned a particular zone of attack. The infantry regiments of the first echelon were, in turn, divided into two echelons in order to provide depth to the attack and ensure a steady flow of replacements for losses in the first echelon. General reserves of tanks, artillery, engineers, and aircraft provided the division with support for co-ordinated operations.

Strong Points Bypassed

Efforts were made to bypass strong centers of resistance and to cut off the retreat routes of the defenders. Tank formations were employed in order to break through the defense sectors and provide opportunities for attacking neighboring sectors from the flanks and the rear.

Soviet infantry forces generally avoided passing through the streets by making use of gardens, courts, and underground passageways. Explosives often were used to make passageways through walls and buildings in order to have better routes of approach.

An effort was made to gain entrance to the roofs of the buildings in order to reduce the observation capabilities of the enemy. After this was accomplished, the remaining floors and rooms were taken one after the other, in order to drive the enemy down and out of the buildings. Often, the enemy troops took refuge in the cellars—particularly during bombardments—and it was necessary to keep them from coming out by flooding the cellars and employing artillery fire against the exits.

All Weapons Used

All of the infantry weapons were used during the actual house-to-house fighting, particularly grenades. The guns and tanks operating through the streets often were echeloned in depth, with the forward echelon combating the ground floors of the buildings and the rear echelon taking the upper floors under fire. After openings were blasted in the buildings, and while the artillery was still continuing its fire, smoke screen equipment was employed. During this preparation, the infantry moved in as close as possible, and attacked as soon as the artillery fires were lifted. If the resistance was too great, the building, or buildings, were set on fire. Every block of buildings that had been taken was mopped up carefully.

When a position was taken from the enemy it was prepared immediately for use as a defense position in case the enemy counterattacked.

The success of ground operations in any future war will depend more than ever on the degree of air support and transportation furnished the Army. With the increased fire power afforded by tactical air support to isolate the enemy and drive him to cover, our ground units can gain freedom of movement quickly to overcome an enemy. And this air support can come from either the Air Force, Navy, or Marines.

General J. Lawton Collins

Development of Warships Since 1900

Digested by the MILITARY REVIEW from an article by Captain R. Oliver-Bellasis, Royal Navy-Ret., in "The Navy" (Great Britain) July and August 1951.

THE fleet in 1900 was, in the main, the result of the Naval Defence Act of 1889. There had been a serious scare of a war with Russia a few years earlier, and our lack of preparedness had been revealed with the result that an agitation by, among others, Lord Fisher was successful in getting the new act passed. By this measure, a program of 70 ships, spread over 5 or 6 years, was authorized, and most of these ships were in service in 1900. The first fruit of this building program was a class of battleships, the Royal Sovereign Class (1891-92), of eight ships. This class merits a more detailed description as typical of the pre-Dreadnought type of battleship.

They were approximately 14,000 tons, with a speed of 17 knots, burning coal, with reciprocating engines, and were armed with 4 13.5-inch guns, with a secondary armament of 10 6-inch guns. The heavy weapons were not in turrets as in the more modern ships, except in the case of the *Hood*, but were mounted on turntables into which the breech ends were lowered for loading. Thus, although the crew was exposed, the ammunition supply was protected by the armor surrounding the barbette.

Ramming and Naval Attacks

As a result of the Battle of Lissa, between the Italians and Austrians, in 1866, when ships were sunk by ramming, all ships had been equipped with a ram bow, and ramming was regarded as a formidable method of attack. This was, of course, a result of the very short ranges (3,000 yards) at which a battle, even with 16.5-inch guns was expected to be fought in the latter half of the nineteenth century. Even as late as 1904, Lord Fisher was advocating the abolition of the ram as part of his reform of the shipbuilding program.

The twentieth century opened with Tirpitz as Germany's Secretary of the Navy and the German Second Navy Act, which started Germany on her career of naval expansion and the Kaiser's open challenge to British sea power.

The succession of building programs under the Naval Defence Act finished with the last pre-Dreadnought type of battleship, the King Edward VII Class. These ships of 16,000 tons, 19 knots speed, and with reciprocating engines, were armed with 4 12-inch, 4 9.2-inch, and 10 6-inch guns. In World War I, these ships were affectionately known as the "Wobbly Eight."

The torpedo boat had been produced earlier and designed to attack the enemy battlefleet with torpedoes by night. The secondary armament of battleships was intended to deal with this menace. The torpedo boat destroyer also was intended originally to be a defense against the torpedo boat, but soon adapted itself to attack, and the torpedo boat vanished from the building programs.

As a passive defense against torpedoes, battleships relied on torpedo nets fitted on booms. For a time, these were successful, but were defeated by improvements to the torpedo and by the net cutters fitted to the warheads. The nets reappeared in World War II, though not fixed to the battleships. In 1915, the *Implacable*, an 1898 battleship on guard against the Turks in the Suez Canal, erected barbed wire entanglements on her torpedo booms, a novel use for these fittings.

Lord Fisher and Naval Construction

The first submarine was launched in 1901, and a succession of classes followed, with steady progress being made as more

seaworthy and larger ships were produced. In 1904, Lord Fisher began his tenure of office as First Sea Lord, a period which was to have profound and beneficial effect on the Navy. In this year, he warned the country that a revolution in naval warfare was impending because of the submarine. In the same year, he called for inviolate watertight bulkheads, a subdivision and protection of magazines, and a reduction of weight, which sounds strangely modern to our ears.

The *Dreadnought* Changed Naval Construction

In 1906, the *Dreadnought* was produced. This ship was built in great secrecy, and in the astonishingly short time of 1 year. She mounted 10 12-inch guns in five turrets, three of which were on the center line. She carried no secondary armament other than 12-pounders, but this armament was restored in later classes. She was the first large ship to have turbines. At the Diamond Jubilee Review at Spithead, in 1897, Sir Charles Parson had demonstrated the *Turbinia*, a turbine engine yacht, which defied the efforts of naval craft to catch her. This forced the Navy to consider the turbine seriously, and marked the beginning of the eclipse of the reciprocating engine. The first turbine engine destroyers, the *Viper* and *Cobra*, were ordered soon afterward in 1899 and 1900.

The Board stated that the armament of the *Dreadnought* was decided by gunnery, and her speed by strategical considerations. This all large gun ship marked a tremendous advance in battleship design and made all previous classes obsolete. Thus, it meant that Germany and Britain virtually restarted a naval armament race from scratch, and it even has been argued that it was a mistake to have produced such a powerful ship.

Improvements in Fire Control

Meanwhile, under Sir Percy Scott, serious attempts had been made to introduce fire control systems and to lengthen the ranges at which battles could be fought.

In order to win a battle, an admiral had to bring all the guns of all his squadron to bear on the enemy, and to do this, the fleet had to be formed up or deployed in a suitable formation which depended on the position, course, and speed of the enemy. In order to learn this information cruisers were used. Initially, these were light cruisers, but, eventually, armored, and, finally, battle cruisers were used to penetrate the screen of cruisers around the enemy fleet. These armored cruisers also were intended in pre-Dreadnought days, to be used occasionally in the line of battle, for example, by the Japanese at Tsu Shima in 1905.

Typical light cruisers of the 1900s were the Eclipse Class of 5,600 tons, with 11 6-inch guns and 19½ knots speed, built in 1894 to 1896. These were followed by a series of classes. A typical post-Dreadnought type of light cruiser was the Bristol Class built in 1909-10 of 4,800 tons, 25 knots, and 2 6-inch and 10 4-inch guns. A few cruisers were built as flotilla leaders (such as the Boadicea Class of 3,400 tons, 25 knots, with 10 4-inch guns), but otherwise after the Bristol Class the majority had 6-inch guns only. The later ships served with the Grand Fleet in World War I and eventually were followed by the four C Classes of 1914-17, and the D Class of 1917, armed with four to six 4-inch or 6-inch guns, according to the class, and speeds up to 29 knots. All these ships were built with the idea of trade protection and in a fleet action of finding and reporting the position of the enemy, if necessary, fighting off his cruisers in the process.

In the battleship classes, the *Dreadnought* was followed by the Bellerophon, St. Vincent, and Colossus Classes at the rate of roughly a class of three or four ships each year. In 1909, with the Orion Class, the 13.5-inch gun was introduced to

give greater accuracy by using the lower muzzle velocity. Then followed the King George V and Iron Duke Classes. The post-Dreadnought type of ships formed the backbone of the Grand Fleet in World War I. In 1913-16, the Queen Elizabeth and Royal Sovereign Classes of 25 and 23 knots, carrying eight 15-inch guns, were commissioned, and these ships gave good service, not only in World War I but in World War II.

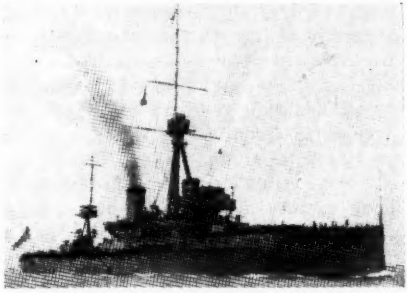
Shortly after the *Dreadnought* was laid down, ships of battleship size and armament, but with the speed of cruisers, were produced. These were called battle cruisers and were intended to operate ahead of the main battlefleet and support the cruisers. They had less armor than the battleships, but were intended to fight in the line in the initial stages of an action. The Invincible and Indefatigable Classes of 1907-12, with 12-inch guns, were followed by the Lion Class—the *Repulse*, the *Renown*, and the *Hood*—each matching the battleships of the day. The *Hood*, of 41,000 tons and eight 15-inch guns, produced in 1918, was the first ship to have geared turbines.

It was customary for battleships to have submerged torpedo tubes, while some of the battle cruisers had above-water tubes. The last battleships to be thus armed were the *Nelson* and the *Rodney*, which had 24½-inch torpedoes. Later, all submerged tubes were removed and the flats (torpedo rooms) were subdivided. This was necessitated by the demand for greater watertight subdivision and the fact that the torpedo, when fired from battleships, had not been particularly successful.

With the realization of the potentialities of the submarine, a period of intensive building of destroyers materialized, of which the Admiralty M Class, 1914-17, and the V and W Classes may be selected as typical. The former had two twin torpedo tubes, three 4-inch guns, and 34 knots speed. The latter carried an extra 4-inch gun and two triple tubes. The 4.7-inch gun was introduced in the later classes.

Lessons From Jutland

In ship design, the lessons of Jutland indicated the necessity for full tests, under service conditions, of our armaments, for our shells proved defective. The loss of three ships, the *Queen Mary*, the *Invincible*, and the *Indefatigable*, by magazine explosions at Jutland, as well as similar disasters to the older cruisers, focused more attention on the protection of magazines. Unfortunately, the *Hood* was to be lost from unknown but possibly similar causes in World War II.



The *Dreadnought*, whose construction made all other classes of battleships obsolete.

The Submarine Menace

The most outstanding feature of World War I, however, was the power of the submarine, demonstrated by the sinking of the three armored cruisers, and the tremendous power of the German submarine blockade; repeated even more effectively in World War II. The submarine had developed into a powerful ship and the E Class may be taken as typical, with about 55 being built. They were of about 800 tons, had a surface speed of 15 knots, and were equipped with five torpedo tubes. The L Class represented the final submarine development of the war, the tonnage having risen to 1,080 and the surface speed to 17½ knots.

The K Class was an interesting development, with some 18 boats being constructed. They were of about 2,700 tons, had 24 knots speed, and were driven by steam machinery when on the surface. The underlying idea in the construction of these ships was that they should operate with the fleet, in particular for torpedo attack on the enemy battlefleet, as well as for reconnaissance.

Naval Use of Air Power

World War I also brought forth the beginning of air power with the use of the aircraft and seaplane carriers. The *Engadine*, a seaplane carrier, flew off a seaplane at Jutland, while the first decked carrier, a converted Cunard liner, the *Campania*, was in service at the end of the war. The Germans constantly attempted to use their Zeppelins for reconnaissance purposes, so much so that fighters were carried on the guns of the turrets of battleships for defense. These aircraft had to land in the water and the pilot had to be picked up.

With the end of World War I came the Treaty of Washington, limiting battleships to 35,000 tons and cruisers to 10,000 tons. In 1925, the *Nelson* and the *Rodney* followed as a result, with their unique arrangement of nine 16-inch guns in three triple turrets forward. Their secondary armament was 12 6-inch guns and they were the last class to have a separate antiaircraft armament of 6 4.7-inch guns. The King George V Class, also of 35,000 tons, which followed in 1939, had 10 14-inch guns, but these were of greater range than the previous 15-inch weapons. In these ships, the antiaircraft and secondary armaments were combined in 5.25-inc turrets, and the arrangement of the main armament in two quadruple and one twin turret was novel.

Another consequence of the Washington Treaty was the introduction of the County Class of cruisers of 10,000 tons in 1926. These large, very lightly protected ships carried eight 8-inch guns in twin turrets, were designed for trade route protection, and did much good work in this role in World War II. They probably were some of the most comfortable warships ever produced. The smaller York Class followed with two less guns and less freeboard, and in 1931 the Leander Class set the new fashion for a series of classes with 6-inch guns, afterward reduced to 5.26-inch in the Dido Class, most of which were completed during the war years.

The development of destroyers proceeded normally between the wars. The 4.7-inch gun introduced in World War I was retained. The main armament of torpedo tubes was increased to eight. The main use of destroyers was considered to be a torpedo attack on the enemy battlefleet and this was to be co-ordinated and massed if possible. Destroyers also carried the then new Asdic apparatus to assist in their duties as antisubmarine escorts.

The Rise of Air Power

The main interest of the interim period was the rise of air power. Aircraft operating from flat decks instead of seaplanes became general, and many cruisers and some capital ships carried an amphibian aircraft on a catapult, of which the *Walrus* is the best known type. The fighter on the turrets of battleships lingered on till the late 1920s.

The first carriers were conversions: the *Argus* from an Italian liner, the *Eagle* from an ex-Chilean battleship, the *Cochrane*, the *Furious*, the *Glorious*, and the *Courageous* from large, light cruisers. The *Furious* had a small island bridge, but the funnel was at the side of the ship, like the *Argus*. With the *Eagle*, however, the modern type of island bridge was introduced and this has been standard since. The *Furious*, the *Glorious*, and the *Courageous* were designed originally as cruisers, when Lord Fisher was First Sea Lord in World War I, and they reflect his views on the superiority of speed to armor. As cruisers, they were not a success, but all

did magnificent work as aircraft carriers.

The emphasis on the use of the air power of the carrier was, at the time, first, reconnaissance and then by a torpedo attack to slow down the enemy battlefleet or to disable the opposing carriers. The *Ark Royal*, completed in 1937, did excellent work in World War II and was the first modern carrier designed as such. It was followed by the Illustrious Class of six ships.

Antisubmarine Escorts

World War II opened with the German mining campaign and their submarine blockade. As far as the building programs were concerned, the completion of the Illustrious, King George V, and Dido Classes were the main features in the early part of the war apart from the usual emphasis on the production of destroyers, whose principal duties were those of antisubmarine escorts. The demand for escorts of all types was so great that frigates and corvettes, specially designed for escorting convoys, were produced in large numbers, while numbers of the V and W Class destroyers of the years 1918 and 1919 were converted to make them more effective as antisubmarine vessels. This conversion principally consisted of removing the torpedo tubes and part of the gun armament and increasing the number of depth charges carried.

As far as ship construction went, the German ground mines had an unexpectedly great effect on our ships, and Lord Fisher's call for inviolate watertight bulkheads and more and better subdivision will be recalled. In the interwar years, considerable steps had been taken to increase and improve the antiaircraft armament of ships, but even this proved inadequate to deal with concentrated air attacks to which ships were often subject without shore based support. Naval air power achieved much success, particularly against the Italians at Taranto, and both carriers and shore based aircraft were an indispensable part of the transocean escort force. The Japanese, however, were the first to exploit the effect of concentrated carrier-borne air power in their attack on Pearl Harbor, and, thereafter, the main Pacific battles primarily were those of naval air power. Battleships were included in the forces, but they were no longer the backbone of the fleet, and were reduced to carrier escort and bombardment roles. Air search and radar replaced the necessity for the cruiser screen of the prewar period, the cruisers being used like the battleships to escort the carriers and to provide additional antiaircraft fire.

The two decades since 1918 had seen a steady advance in steam machinery by the use of geared turbines, higher boiler pressures, and temperatures which enabled lighter machinery to be used. This was aided by increasing the size and horsepower of the boilers so that 8 might do for a capital ship instead of perhaps 20. However, the Americans went further and had great success with machinery giving greater economy at certain speeds.

In the postwar years, the gas turbine has been developed, and, while for marine use it is still in the experimental stage, there appears no doubt that it already is the most suitable prime mover for a number of specialist applications such as motor torpedo boats, but that further development will be required before it can displace the high-pressure steam sets for the larger ships.

Emphasis on Antisubmarine Craft

Since the war, the emphasis has been on antisubmarine craft, and it is apparent that the destroyer no longer will be primarily a vessel to attack the enemy with torpedoes, but an antisubmarine and antiaircraft escort vessel. The full extent of this change has yet to be seen. The last class of destroyers, the Daring, now being completed, a development of the Battle Class, deserves a mention as being the apothesis of the torpedo boat of the 1880s.

She has six 4.7-inch guns in twin turrets together with two sets of quintuple 21-inch torpedo tubes, displaces 2,600 tons, and is the largest destroyer ever built for the Navy.

As regards carriers, at the end of the war, the light fleet carrier, a warship built to merchant ship shipbuilding standards, was produced to circumvent the delay in building the full fleet carrier with its armored deck. As the foundation of the fleet is now the carrier, more of these ships must be expected to reinforce the fleet carrier, which, in its latest form, is represented by the *Eagle* and the *Ark Royal*, which are not yet in service. These ships, with their armored decks, are of 36,000 tons displacement, carry about 100 aircraft, and a large complement of about 2,700 men.

In any foreseeable war, however, it is clear that it is on the unspectacular anti-submarine escort and the minesweeper that the safety of our sea communications will chiefly depend.

An All-Arms Training Center

Digested by the MILITARY REVIEW from an article by Ronald W. Clark in "The Canadian Military Journal" September 1951.

BELGIAN, French, Danish, and Norwegian troops and observers are among those who during the last few months have been taking advantage of the great training areas and "battlegrounds" in the British zone of Germany. These training areas, many of them originally built for and used by the German Army, include the antiaircraft ranges of Soltau, the tank training area of Hohne, and, perhaps most important of all, the 100-square-mile swathe of country around the All-Arms Training Center at Sennelager, near Paderborn, Westphalia.

Ranges Are in Constant Use

It is about 5 years since Field Marshal Lord Montgomery, then in command of all of Britain's forces in Northwest Europe, first visited this former Wehrmacht training area and decided that it should be used by our forces. No fewer than 38 firing ranges—for almost every weapon from the rifle to field artillery—are in almost constant use. And to watch the "battles" which are fought at Sennelager, military observers come from all parts of Europe and from countries of the Commonwealth, including India, Pakistan, Canada, and Australia.

The Language Problem

One of the most interesting aspects of the Rhine Army is that with Belgian, Norwegian, and Danish units attached, it has been possible to smooth out many of the inevitable problems—typical being those of communications—which occur when troops of different nationalities, and speaking different languages, are operating virtually under one command. In this way, much of the ground work on which a European army must be based already has been carried out, while it should be noted that a Dutch liaison officer is stationed at Army Headquarters at Bad Oeynhausen to ensure that there is full co-operation with the Dutch forces just over the western frontier of the British zone.

The scope of the training activities at Sennelager is wide. Yet the training center is run by a small staff of officers and men of Britain's forces. Most of the "mechanics" of range control are carried out

by German civilians who work under the orders of the range control officer.

On the purely theoretical side, the center contains the School of Mines, where engineers learn the difficulties of dismantling mines and of passing through heavily mined areas. It contains special blocks of buildings where administration and similar courses are held, as well as an auditorium, in which more than 100 staff officers can discuss problems of strategy presented to them on a large-scale relief model.

Ranges for All Types of Training

However, the pride of the center consists of the ranges which are better suited to the practical battle training of the soldier than any ranges in Europe.

At one end of the scale there is the small-arms range where the target consists of a stretch of miniature countryside across which model vehicles and tanks move and in which targets appear at unexpected places. At the other end of the scale there is the mile-wide stretch of range on which Britain's 52-ton *Centurion* tanks can blast away with their 20-pounders. In addition, there is a battle course range, grenade course, and a patrol course.

Special Jungle Training Area

The center has a special jungle training area, where the assault crossing of a river can be carried out under simulated battle conditions. At another area, a complete training village is used for platoon combat problems; a ruined village is used to teach the details of street fighting.

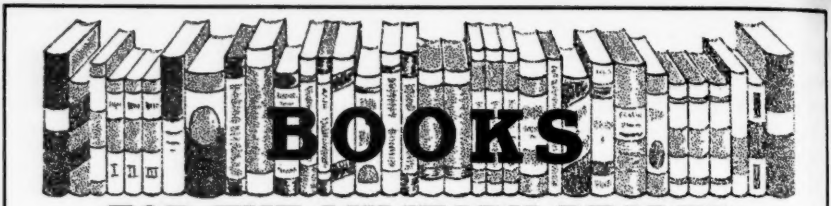
While such ranges are of incalculable value to the West European troops, the center's great advantage is that it can be used for field exercises by thousands of troops who have plenty of "elbowroom" for maneuvers.

After watching the troops of many allied nations engaged in combat maneuvers and training, one quickly realizes that the comfortable "occupation" days have gone, and that today training takes first priority in Western Germany.

We tended in the early days of the Korean campaign to evaluate our experiences and to draw lessons based on World War II conditions. Korea provided many major differences from situations encountered by our forces in either the European or Pacific theaters. The inadequate road and rail nets; limited mobility for offroad vehicular traffic, incident to rice-paddy country as well as to extremely rugged hill and mountain terrain; strong and widely distributed guerrilla forces; language barriers and the nature of the enemy, all combine to present a very different set of conditions from those met by our major forces during any part of World War II.

On the other hand, everything that has transpired in Korea accentuates the basic soundness of our tactics and military doctrine for the employment, separately and in combined operation, of the several arms of our military establishment.

General Matthew B. Ridgway



BOOKS
FOR THE MILITARY READER

GENERALS AND POLITICIANS: By Jere Clemens King. 244 Pages. University of California Press, Berkeley and Los Angeles, California. $3.50.

By LT COL PAUL L. BOGEN, *Armor*

The ever present problem of a nation at war is the delineation of responsibility. The ever present conflict is based on policy *versus* strategy. The interaction, involvements, conflicts, and controversies between the political and the military are exemplified by the history of France in World War I. *Generals and Politicians* is the detailed account of the politico-military relationships and complications which develop when a great democracy is engaged in war.

French General Headquarters had no Pentagon, but relationships between the government and the military were as involved as any that develop in our own military labyrinths. Problems were accentuated by the multiparty system and lack of precedents. The conduct of military activities and the strategy and tactics involved are presented clearly. However, the relationships of the personalities and the political parties are the prime concern throughout.

In the pages of this book we find, colorfully presented, the great leaders of France in World War I, many of whom continued in power for the next quarter century. Here we find "Papa" Joffre as a commander in chief, not as the "Hero of Paris." Briand, Foch, "Tiger" Clemenceau, and the ill-fated Petain become human and partisan, thus assuming proportions less Homeric than popular history sometimes gives them. This is a complete and detailed account minus the aura of final victory.

A slightly philosophic conclusion states: "If any lesson is to be drawn from France's experience, it would probably be the counsel of perfection for a nation to 'have a good history'—a set of conditions in which an able civilian government maintained national interests by effective diplomacy, closely supported by a capable military who were willing to remain in their proper place. If war proved unavoidable, the government would clearly understand the political ends to be reached, the military the means of their achievement."

This almost reads like a prayer for the present. Indications of the answers for the present may be found in the lessons of the past.

Generals and Politicians is a scholarly and interesting book which is of more than passing value for prospective generals and politicians.

CENTRAL AND SOUTH EAST EUROPE: 1945-1948. Edited by R. R. Betts. 227 Pages. Royal Institute of International Affairs, New York. $3.50.

A symposium.

THE FOURTH ARMORED DIVISION. From the Beach to Bavaria. By Kenneth Koyen. Illustrated by Frank Besedick. 296 Pages. Fourth Armored Division Association, Fort Knox, Ky. $5.00.

PACIFIC VICTORY: A Short History of Australia's Part in the War Against Japan. By Hugh Buggy. Issued by the Australian Minister for Information.

By COL GEOFFREY G. ELLIOTT, *British Army*

"While the masterly leadership of General Douglas MacArthur and the powerful aid of the United States is given grateful recognition, it is felt that there is need for a complete chronological record of the deeds of Australian servicemen in the Pacific war theater. This is the first time in which their deeds in all engagements from Malaya to the Japanese surrender in Tokyo Bay have been brought together in one compact and handy volume."

The author has indeed done a good job, while it must be admitted, as the Minister for Information says, "in no sense is this book intended as a comprehensive or exhaustive military history."

As a reference book for the student of military history it is useful; as a story for the general reader, the book is vivid and interesting. The contents deserve a higher standard of printing and production, especially of the many photographs.

GEOGRAPHY OF THE U.S.S.R. A Regional Survey. By Theodore Shabad. 584 Pages. Columbia University Press, New York. $8.50.

THE ASSAULT ON PELELIU. By Maj. Frank O. Hough, U.S.M.C.R. 209 Pages. Illustrations and Maps. US Government Printing Office, Washington, D.C. $2.50.

CINDERELLA OF EUROPE. By Sheila M. O'Callaghan. 199 Pages. Philosophical Library, New York. $3.75.

JOHN QUINCY ADAMS: His Theory and Ideas. By George A. Lipsky. Introduction by Allan Nevins. 347 Pages. Thomas Y. Crowell, New York. $4.50.

EUROPE FROM 1914 TO THE PRESENT. By Victor L. and Marguerite Hall Albjerg. 816 Pages. McGraw-Hill Book Co., Inc., New York. $5.50.

By COL GEORGE C. REINHARDT, *CE*

In treating so vast a subject in a single volume, the authors appear to have allocated space on a passage-of-time basis: Part One, World War I, 64 pages; Part Two, Between the Wars, 415 pages; Part Three, World War II, 146 pages; and Part Four, After World War II, 191 pages. As a result, military history is no more than an outline of results, and, similarly compressed, the politics and economics of nations are reviewed rather than recorded.

However, as an elementary text from which to proceed, this book is valuable and easy reading. The maps provided are more profuse than is customary with many histories, and they are uniformly well drawn and enlightening. Illustrations lean heavily toward excellent photographs of national leaders.

Not to be confused with the same publishing house's more profound "Series in Political Science," the book creditably continues McGraw-Hill's "Series in History" tradition of an unbiased treatment of modern times.

SAIPAN: The Beginning of the End. By Maj. Carl W. Hoffman, U.S.M.C. 286 Pages. Illustrations and Maps. US Government Printing Office, Washington, D.C. $3.25.

PUBLIC OPINION IN SOVIET RUSSIA. By Alex Inkeles. 379 Pages. Harvard University Press, Cambridge, Mass. $5.00.

JEFFERSON: The Scene of Europe, 1784-89. By Marie Kimball. 357 Pages. Coward-McCann, New York. $6.00.

THE POLICE STATE. By Craig Thompson. 257 Pages. E. P. Dutton & Co., New York. $3.00.

SOVIET RUSSIAN LITERATURE, 1917-1950. By Gleb Struve. 414 Pages. University of Oklahoma Press, Norman, Okla. $5.00.

By HAROLD F. HARDING, *Ph.D.*

This is a valuable general survey of Soviet literature from the 1917 Revolution to the present. For the military reader perhaps the last three chapters have greatest appeal. They deal with "Literature on War Service, 1941-46," "Toeing the New Party Line, 1946-50," and "Conclusion: The True Meaning of Socialist Realism." Here we find some explanation of the writings of such men as Tolstoy and Ehrenburg and expositions of "The Anti-Westernist Witch Hunt" and "Stalin the Great."

But in a larger sense, Dr. Struve, who is professor of Russian Literature at the University of California and who was educated in Petrograd and at Balliol College, Oxford, has really provided a veritable index to the Russian character—at least as portrayed in the literary output of the past 35 years. Americans and Western Europeans who want to try to understand the Russian Communist as a soldier and as a party worker will find this book an indispensable guide to the "official" literature and the strict "party line"—that is, as it was up to the date of publication.

THE BRITISH OVERSEAS. By C. E. Carrington. 1,092 Pages. Cambridge University Press, New York. $9.00.

England's global role, since the discovery of the New World.

AN INTRODUCTION TO HISPANIC AMERICAN HISTORY. By Tom B. Jones and W. Donald Beatty. 667 Pages. Harper & Bros., New York. $4.50.

A revised edition.

CONGRESS AND FOREIGN POLICY. By Robert Dahl. 305 Pages. Harcourt Brace & Co., New York. $4.00.

THE RISE AND FALL OF THE JAPANESE EMPIRE. By David H. James. 409 Pages. The Macmillan Company, New York. $5.00.

By LT COL MAURICE K. SCHIFFMAN, *Inf*

Despite the fact that the author is influenced by his long imprisonment, this book is an excellent authoritative historical reference for the military reader.

Mr. James spent most of his life in the Far East, first visiting Japan in 1883. At the outbreak of hostilities, he was a British intelligence officer in the Malaya Command.

In his text, the author depicts the gradual rise of the military class in Japan, together with the relegation of the Imperial family to a relatively obscure position. Tied closely to the emergence of the military is the economic development of Japan. Mr. James traces this development from 1868, when Japan's "Bamboo Curtain" was lifted, and economic intercourse with the outside world was begun.

OKINAWA: ISLE OF SMILES. By William E. Jenkins. 160 Pages. Bookman Associates, New York. $2.50.

By LT COL DANIEL A. NOLAN, JR., *Inf*

This little volume is a picture-book glimpse of the island of Okinawa and its inhabitants. It is devoted chiefly to the people whom the author regards quite highly for their cheerfulness, strength, and industry. His light, sometimes humorous, commentaries serve as introduction to groups of excellent photographs, which deal with babies, youngsters, buildings, landscapes, and art.

Mr. Jenkins does not force on the reader his concept of Okinawa; he presents it in his pictures, 270 of them. His book is interesting, especially to those whose memories of Okinawa are tinged by the bleak panorama of war and who, perhaps, rarely or never saw a native Okinawan.